

# MARINE REVIEW.

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No. 1.

## Death of Rear Admiral Ammen.

Death came this week, after a lingering illness, to Rear Admiral Daniel Ammen, whose connection with the United States navy for almost half a century has been marked by many important and meritorious services, but whose most lasting fame is likely to be found in his invention of the Katahdin, the only vessel in the United States navy in whose design the ram is a primary factor. There are few periods in the life of the deceased officer that are void of exceptional interest, beginning with his boyhood as a playmate of Grant. At fifteen years of age he entered the navy as a midshipman, studied at West Point, served with distinction in the civil war, much of the time as commander of the monitor Patapsco, was in command of the monitor Miantonomah for some time after the war, then in turn chief of the bureau of yards and docks of the navy department, and chief of the bureau of navigation, reorganized the hydrographic office, was a prime mover in the agitation of the Isthmian canal project and the surveys relative thereto, and incidentally wrote extensively, among other things his autobiographic story, "The Old Navy and the New."

The admiral's conception of the ram Katahdin was the result of twenty-seven years' study of the subject. During all that time he made calculations of weights and studied the lines of naval construction and displacement most favorable to speed, facility of turning and immunity from damage by the fire of an enemy. It was ten years, however, before he could secure favorable action from official sources, and although at the expiration of that time the naval advisory board recommended the building of five vessels of the Ammen type, it was fourteen years more before congress could be induced to make the appropriation for even one. The officers of our own as well as other navies have watched the Katahdin with



THE RAM KATAHDIN.

intense interest, and are doing so even yet, and this has naturally resulted in a lively discussion of her merits, some adverse comment having been made on the fact that she has not developed the speed expected. Admiral Ammen always argued that this outcome was due to the alteration of the lines which he laid out for the vessel to suit the views of the bureau of construction of the navy. The Katahdin was built in 1893 at the Bath Iron Works, Bath, Me. She is 251 feet in length, 43 feet beam and 2,155 tons displacement. She has two horizontal triple expansion engines of 4,800 horse power. The designed speed was 17 knots, but on trial she made only 16.11. In this connection it is interesting to note a coincidence in the fact that the old Alarm, the only other ram constructed since the civil war, and which has been for twenty-five years one of the curiosities of the Brooklyn navy yard, was this week towed to Philadelphia, where she will be sold for junk. Her machinery was taken out and she was sold at public auction for \$600.

The steamer Superior City, owned by A. B. Wolvin of Duluth, has just arrived at Lorain with a cargo amounting to 7,187 net tons of ore. This is not the largest ore cargo carried this season, however, as has been reported from some sources, the Superior City having, earlier in the season, carried from Escanaba to South Chicago a cargo of 7,642 net tons.

One of the new Davidson steamers, the Chattanooga, has just loaded at Toledo a cargo of 4,139 net tons of soft coal for Duluth. This is a large load for a wooden vessel. The vessel grounded in the Sault river, but was not damaged.

## Gain of a Million and a Half in Ore.

A production of 14,000,000 tons of iron ore in the Lake Superior region this year is now assured; in fact, the increase thus far over 1897 is so large that a total output of 15,000,000 tons would not be surprising. The association of Cleveland ore sales agents has just received from all shipping docks reports of the ore output to July 1. The aggregate is 4,612,193 gross tons, against 3,150,289 gross tons on July 1 a year ago, or a gain of 1,461,884 tons. Add this gain of one and a half million tons in round numbers to the output of 1897, which was practically 12,500,000 tons, and we have 14,000,000 tons as the output of the present year, even without further gains in the remaining months of the navigation season. Escanaba, Gladstone, Marquette and Two Harbors have all shared in this increase of shipments, but the principal gain is at Ashland, where the shipments on July 1 were more than half a million tons in excess of the total on July 1 a year ago. More big vessels, a light grain trade on Lake Superior and deeper draft in the rivers are all factors that have contributed to this great output of ore, but the principal factor was the early opening of navigation. Of the total increase of 1,461,884 tons since the opening of navigation, more than 1,200,000 tons was in May and June. It follows also that a very large part of this early increase in shipments was from stock piles, which have been drawn on thus far more extensively than in previous years. July and August shipments will not show a like increase; it is doubtful, in fact, whether the shipments of these two months will be equal to the output of the same months in 1897. Last year the coal strike was on, and as vessels were all going up the lakes light ore was rushed down at a wonderful rate—full 2,300,000 in each month, which is an amount a little larger than has been moved during the month just closed. It may be well to note also that a large part of the gain in shipments since the opening of navigation is in ore going to South Chicago. At Duluth, where the bulk of Mesabi ore shipments for Ohio ports originates, the output on July 1 was just equal to that of a year ago. This summary of figures from the ore shipping docks certainly shows a very heavy movement of ore, but after all it is quite certain that consumption in the furnaces and steel works is at the rate of about 14,000,000 tons annually, and the output would not be regarded as at all excessive if it were not for the surplus stocks that were on Lake Erie docks when navigation opened.

The only figures of any value relating to the coal movement are contained in the reports of St. Mary's Falls canal. The hard coal movement to Lake Superior on July 1 aggregated 122,656 net tons, against 108,179 net tons on July 1 a year ago, but this increase is of little account, as the hard coal movement as a whole is not an important factor in the freight situation. Of soft coal there had been forwarded to all points above the canal on the first of July 1,051,328 net tons; on July 1, 1897, the shipments aggregated 761,902 net tons. This gain of less than 300,000 tons is not up to what was expected, in view of the large amount of coal contracted for Lake Superior at 20 cents freight, and in view also of the fact that the shipments of a year ago were regarded as very light on account of the strike in the soft coal mining regions of Pennsylvania and Ohio, which delayed shipments until well into September. It is impossible to force a full year's supply of coal into the northwest early in the season. The storage docks become fairly well filled and then the coal dealers of Duluth, Superior, Portage and other places shut off shipments until they begin to relieve the pressure on the docks later in the season. That is what they are doing now, and their action will probably be somewhat to the advantage of the vessel interests later in the fall.

The lake freight situation as regards vessels that are not engaged on contracts could not be worse than it is at present. Only the poorest vessels are laid up, but a mystery is attached to the operation of wooden boats of 1,500 to 2,000 tons that are kept running to the head of Lake Superior, for instance, on 20-cent coal and 45-cent ore, with the greatest difficulty in securing cargoes, even at these rates, every time they are placed on the market.

## Canadian Interests in United States Courts.

United States District Judge Lochlan of Minnesota has just decided a somewhat peculiar case. In October, 1892, the Canadian steamer Arabian carried away a lock in the Welland canal and the escaping water broke the lines of the Canadian schooner Minnedosa below and jammed the schooner against the lock wall. The Minnedosa was damaged something like \$15,000, and claim was made on her underwriters for about that sum. In the fall of 1895 one of the underwriters on the Minnedosa, the Marine Insurance Co., which had paid \$8,000 on account of this damage, libeled the Arabian in the district court at Duluth, claiming of the Arabian \$8,051.20, under the subrogation clause in its policy. The repairs actually made to the Minnedosa were trifling in amount, nearly all of the damage claimed being on account of a disalignment in her side and keel, and which was not repaired. Both vessels were Canadian; the damage occurred in Canadian waters and the insurance company libeling was a foreign company. Objection was made to the court entertaining jurisdiction and was overruled, a court of admiralty being one open to all the world and having the right to exercise jurisdiction in such cases or not at its discretion. The case was heard; the court fixed the damage at \$8,000 and decreed that amount to the insurance company. The case will doubtless be appealed. C. E. Kremer appeared for the insurance company and Harvey D. Goulder and H. R. Spencer for the Arabian.

The W. & A. Fletcher Co. of Hoboken, N. J., has secured from J. Piernont Morgan an order for a new steel steam yacht. The order is carte blanche and there is a probability that the vessel will be the finest of her class on this side of the Atlantic.



### Marked Decrease in the Movement of Wheat.

An immense falling off in the movement of food stuff from Lake Superior is shown by the report of the Sault Ste. Marie canals for July. Statistics compiled by the Review from these reports show that the aggregate movement of wheat so far this season is over 50 per cent. less than for the corresponding period last year, whereas a comparison with the corresponding period of 1896 is even more disparaging. The figures this year are 7,743,183 bushels, as compared with 15,740,713 bushels in 1897 and 19,101,185 bushels in 1896. A decrease is also noted in the movement of flour—about 500,000 barrels to July 1. On the other hand, there is an increase in the movement of grain other than wheat, but this increase is not important, as it is less than 3,000,000 bushels. In view of the fact that soft coal shipments were very light all through the early part of last season, on account of the strike in the mining regions of Ohio and Pennsylvania, the canal reports as regards soft coal are not discouraging from the vessel owner's standpoint. It was expected that soft coal shipments to Lake Superior would be very heavy, but the aggregate movement to all ports above the canal on July 1 was less than 300,000 tons in excess of shipments on the same date last year. The figures are 1,051,328 net tons to July 1, 1898; 761,902 tons to July 1, 1897, and 831,403 tons to July 1, 1896. Iron ore shipments from all upper lake ports are dealt with elsewhere in this issue. The movement of freight of all kinds through both canals aggregated 6,321,812 net tons on July 1, as against 5,015,928 tons on the same date a year ago. Following is a full summary of canal commerce to July 1 of each year for three years past:

#### MOVEMENT OF PRINCIPAL ITEMS OF FREIGHT TO AND FROM LAKE SUPERIOR.

ITEMS.	To July 1, 1898.	To July 1, 1897.	To July 1, 1896.
Coal, anthracite, net tons.....	122,656	108,179	136,191
Coal, bituminous, net tons.....	1,051,328	761,902	831,403
Iron ore, net tons.....	3,722,548	2,566,910	2,931,703
Wheat, bushels.....	7,743,183	15,740,713	19,101,185
Flour, barrels.....	1,995,530	2,467,279	1,951,565

#### REPORT OF FREIGHT AND PASSENGER TRAFFIC TO AND FROM LAKE SUPERIOR, FROM OPENING OF NAVIGATION TO JULY 1 OF EACH YEAR FOR THREE YEARS PAST.

EAST BOUND.				
ITEMS.	Designation.	To July 1, 1898.	To July 1, 1897.	To July 1, 1896.
Copper .....	Net tons...	45,544	44,385	41,271
Grain.....	Bushels.....	10,648,127	7,734,933	7,431,201
Building stone .....	Net tons...	3,075	2,818	5,030
Flour .....	Barrels.....	1,994,828	2,467,029	1,951,565
Iron Ore.....	Net tons...	3,722,548	2,566,910	2,931,703
Iron, pig.....	Net tons...	11,586	200	7,591
Lumber .....	M. ft. b. m.	243,160	225,319	227,852
Silver ore.....	Net tons...	7,743,183	15,740,713	19,101,185
Wheat .....	Bushels.....	7,743,183	15,740,713	19,101,185
Unclassified freight .....	Net tons...	78,005	75,305	56,261
Passengers.....	Number....	2,658	3,003	3,747

WEST BOUND.				
Coal, anthracite.....	Net tons...	122,656	108,179	136,191
Coal, bituminous.....	Net tons ..	1,051,328	761,902	831,403
Flour .....	Barrels .....	702	250	62
Grain .....	Bushels.....	4,250	.....	1,109
Manufactured iron.....	Net tons...	72,668	34,053	26,477
Salt .....	Barrels .....	114,117	72,454	82,765
Unclassified freight.....	Net tons...	136,178	103,464	104,414
Passengers.....	Number ...	3,823	3,041	3,544

#### SUMMARY OF ENTIRE FREIGHT MOVEMENT.

	To July 1, 1898.	To July 1, 1897.	To July 1, 1896.
East bound freight of all kinds, net tons.....	4,931,476	3,987,516	4,318,255
West bound freight of all kinds, net tons.....	1,390,336	1,028,412	1,119,157
	5,321,812	5,015,928	5,437,412

The total number of vessel passages to July 1, 1898, was 5,873, and the registered tonnage 5,852,997.

L. W. Ferdinand & Co. of Boston are finding a new field for the megaphone, the instrument which has been of such great service on vessels. It is now coming into almost universal use at athletic and aquatic races and contests, because it enables the judges and other officers to make announcements that can be heard all over the field. Its adoption has been somewhat hampered by the size of the instrument, which is too bulky to be conveniently transported, but this has been overcome by making them collapsible like the drinking cup made for travelers and picnickers. The folding megaphone is made in sections, one fitting in the other, and when not in use the horn collapses into a package about the size of a hat box.

### Appropriations for Harbor Improvements, Lights, Etc.

Notwithstanding the fact that there was a wholesale slashing of the appropriations for maritime purposes provided for in the sundry civil appropriation bill, as originally drafted, the measure, as finally passed by congress just before the close of the session, still makes fairly liberal provision for the more pressing needs of this character. As the Review pointed out last week, the appropriations for a light-house tender on the lakes and for five new revenue cutters for coast service were stricken out, on the theory that the government would at the close of the war have plenty of vessels in the auxiliary fleet available for this service. The appropriations made in the bill as finally passed, are as follows:

Marine hospitals.—For Chicago marine hospital, \$2,350 for invalid elevator and dynamo, and \$35,000 for new building for boiler and power plant, isolation ward, stable and laundry, a total of \$37,350; for boiler house, stack and new boilers in marine hospital at Cleveland, \$8,000.

Aids to navigation.—For light and fog signal station, St. Martin island, entrance to Green bay, \$15,000; for fog signal at Grand Traverse (Cat Head) light station, Lake Michigan, \$5,500; for light-station at or near north government pier at South Milwaukee, \$7,500; for moving Tail point light and fog signal to a point near channel, head of Green bay, \$7,500; for keeper's dwelling, Ludington, \$3,000; for steam light-vessel with steam fog signal, Poe reef, Straits Mackinac, \$15,000; for light-house and depot near northern end Lake Michigan, \$15,000; for light and fog signal, entrance Toledo harbor, \$37,500; for purchase of additional lands for Cheboygan river front range light-station, \$1,750; for light and fog signal stations to mark the new 20-foot channel, Lake St. Clair, \$20,000; for light to mark turning point in channel through Mud lake, \$3,500; for additional set of range lights to mark channel at entrance to St. Mary's river, \$1,000, and for light-house and buoy depot in vicinity of Sault Ste. Marie, \$15,000.

Revenue cutter service.—Authorizing the president to appoint, with the consent of the senate, one constructor for the revenue cutter service, who shall have the relative rank and pay of a lieutenant in that service.

River and harbor improvements, under continuous contracts, war department.—For continuing improvement of Buffalo harbor, \$489,746; for continuing improvement of the harbor at Duluth and Superior, \$770,138; for continuing the improvement of the Chicago river, \$400,000; for continuing the improvement of the Cleveland harbor, \$294,000; for continuing improvement of waterway from Keweenaw bay to Lake Superior, \$450,000.

Surveys.—To war department for printing charts of the lakes and electrotyping plates for chart printing, \$3,000; for surveys, additions to and correcting engraved plates, \$25,000.

Deep Waterways Commission.—For surveys, examination and investigations (including estimate of cost) of deep waterways and the routes thereof between the great lakes and the Atlantic coast, \$225,000, provision being made that the board shall make a report to congress at the commencement of its next session, giving the probable and relative cost of waterways of 21 and 30 feet, with a statement of the relative advantages.

### Rainfall and Lake Levels.

Mr. C. H. Keep of Buffalo, secretary of the Lake Carriers' Association, recently wrote to Mr. Willis L. Moore, chief of the United States weather bureau, and to Representative D. S. Alexander, relative to certain investigations and reports which he has been making regarding lake levels. Mr. Moore in his reply refers to the investigations along this line being made by the United States Board of Engineers on Deep Waterways, more extended reference to which is made elsewhere in this issue of the Review.

Mr. Moore writes as follows: "Your letter of May 9 addressed to me and one of the same date addressed to the Hon. D. S. Alexander were duly received. Your complimentary remarks relative to the recent publication of this bureau on the subject of the rainfall and floods of the Mississippi valley are highly appreciated, and I have no doubt but that a complete investigation of the regimen of the great lakes will, as we believe, demonstrate 'that the changes in the lake levels are due to difference in rainfall on the lake levels in different years, and that the channel improvements have had absolutely nothing to do with the changes in the lake levels.' I should, of course, be much pleased to carry out such an investigation if I had the necessary authority and appropriation; but I must call your attention to the fact that the national government, in response to the request of your citizens, appointed a commission on deep waterways in 1895, to co-operate with a similar Canadian commission, and that its report was published as house document No. 192, fifty-fourth congress, second session. This report gives full data as to lake levels, but also shows that the data relative to evaporation, outflow and run-off from the watershed is very scanty, or wholly wanting. I may add that the rainfall itself is not known with sufficient accuracy to justify some of the refined calculations that are needed in this problem. Following this report the government appointed a second commission, which is now engaged in measuring and observing the data needed by the engineers, but, of course, it will require several years to determine the average conditions prevailing in the lake region. You will, therefore, perceive that we cannot give a satisfactory answer to all your questions until this latter commission makes its final report, and that it is my duty to co-operate with it as far as practicable. Meanwhile, you will find in a late issue of the Monthly Weather Review, which I send you, a short review of the present state of our knowledge of the rainfall and outflow of the great lakes. You will perceive that we can so adjust the assumed drainage and evaporation as to explain the ordinary changes of level without resort to any further hypotheses, and that the influence of engineering works must be almost inappreciable."

A new accommodation train.—July 5 the Nickel Plate road will place in service between Cleveland and Bellevue a very convenient train, leaving Cleveland daily, except Sunday, at 8:30 a. m. Returning, leave Bellevue 4:30. Connection is made with the C. S. & H. R. R. for Bucyrus, Marion, Delaware and Columbus. This train makes an excellent Pleasure Grove train out of Cleveland, for Oak Point Beach and Vermillion. 124, July 20



### WHERE SHAFTER'S ARMY LANDED.

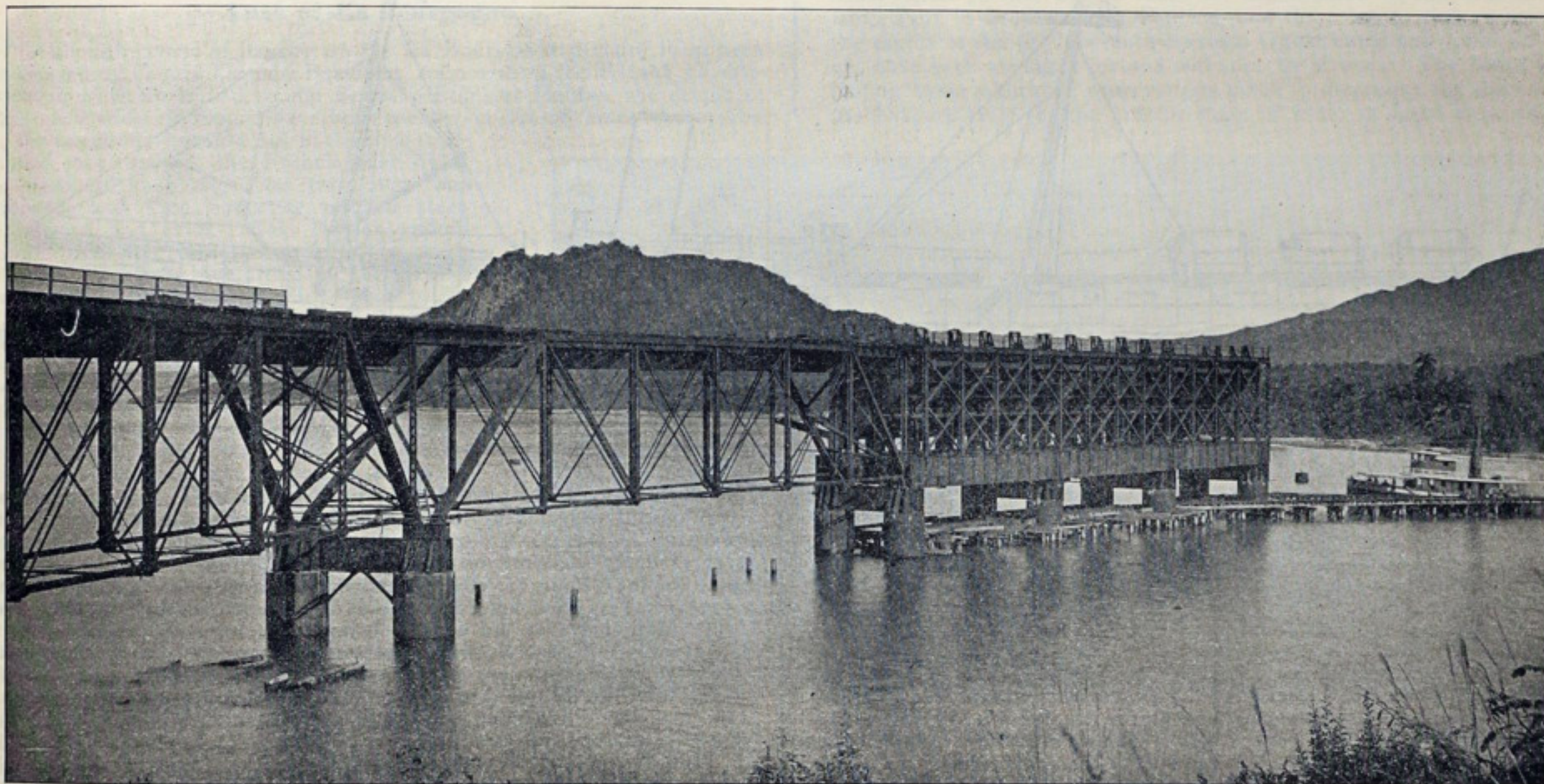
IN THE IRON MINING DISTRICT OF CUBA THAT WAS DEVELOPED BY PIONEERS OF THE LAKE SUPERIOR REGION—EFFECT OF THE WAR ON THE SPANISH-AMERICAN IRON CO.'S PROPERTY.

The effect of the Spanish-American war upon the operation and condition of the iron ore mines in Cuba, more especially since their immediate vicinity has been made the base of operations for both armies, has been watched with a naturally exceptional interest by men identified with the lake marine and with the iron mining industry of Lake Superior. This interest in Cuban affairs on the lakes is due in a great measure to the fact that the men who were instrumental in the development of the Cuban mining properties went to that country from the lakes and almost immediately after having performed a similar service on several of the ranges in the Lake Superior region. The property of the Spanish-American Iron Co., whose steel pier and docks are at Daiquiri (printed by many newspapers Baiquiri), 19 miles east of Santiago, and which constituted the landing place of the greater portion of Gen. Shafter's army, was virtually developed by Messrs. Samuel P. and George H. Ely, who were pioneers in the opening of the Vermillion range in Minnesota. Mr. Charles F. Rand, who, with the Colbys of New York, was among the earliest capitalists interested in the operation of several mines on the Gogebic range, notably the Aurora, is president of the Spanish-American Co., and the Colbys are heavily interested in this property, as they were in those on the Gogebic. The sales agents in this country are Ogilbey, Norton & Co. of Cleveland and Philadelphia.

There are two other American companies in Cuba. The Juragua Iron Co., a corporation in which stockholders in the Bethlehem Iron Co. and Pennsylvania Steel Co. are understood to be largely interested, has

can army the few hundred Spanish troops then occupying Daiquiri retired after doing as much damage as possible to the property of this company.

"The following is a summary of what was done: The machine shop and its valuable contents were burned; the engine house and two locomotives (all we had) were destroyed; an attempt was made to burn the ore cars and the wood work of the ore dock and bridge approach, all of the cars being placed on the dock for the purpose of destruction. This was frustrated by our employees, who extinguished the fire, and our loss in this respect was but one ore car. The ore dock still remains in good condition. A fire was started in the warehouse, but this was also put out by our men. Three trestles of the merchandise wharf were set on fire. This fire was extinguished by our men, and at this wharf practically the entire American army landed. Four Spanish forts or block houses were burned. It was the announced intention of the Spanish to destroy all the forts and all the property of our mining company as well, but lack of time prevented their doing so. Of our extensive stock of supplies on hand—lumber, coal, explosives, mining tools, etc.—the Spanish have destroyed everything they could not take with them. With one exception all of our row boats and sail boats, which are very necessary to our work, were destroyed. One of the buoys to which ships are moored when loading is lost. At the mines all of the houses were ransacked and everything portable was carried away. The railroad track is in good condition and no material damage has been done to any of the five bridges. The water pipe line was cut but has been repaired, and the vessels of the United States navy are now receiving their supply of water from our pipe line. Since the landing of the army at Daiquiri the larger vessels of the American navy continually use the iron ore dock, and the low-grade merchandise wharf is made use of by the smaller vessels for the landing of supplies and equipment. In fact, all of the facilities of the company at Daiquiri have been availed of by the army and navy and every possible assistance



WHERE SHAFTER'S ARMY WAS LANDED.—DOCKS OF THE SPANISH-AMERICAN IRON CO.

mines at Juragua, 5 miles nearer Santiago than those first mentioned, while the Sigua Iron Co., a Philadelphia concern, has a property at a point 7 miles east of Daiquiri, or 26 miles from Santiago. These latter mines, which are 7 miles inland and connected by a railroad with Sigua bay, have not been operated for three years. It will be seen from the picture of the Spanish-American company's ore shipping dock, printed herewith, that the method of loading vessels from pocket storage docks is practically the same as that followed in the Lake Superior region. The landing of an army in such a place was by no means a light task. A circular just issued to stockholders of the Spanish-American company by President Charles F. Rand is especially interesting at this time. Mr. Rand says:

"On April 21, 1898, the property of the Spanish-American Iron Co. was in operation with a full force of employees. One hundred and seventy-five thousand tons of ore were sold in advance for delivery in the United States and Europe, with every prospect, as indicated in the annual report, of a prosperous business during 1898. On the above date war was declared to exist between the United States and Spain, and upon the request of Gen. Linares, commanding the Spanish forces at Santiago de Cuba, the operation of this company's property was discontinued. After repeated interviews with the officials of the state department at Washington, and acting upon their advice, all American employees were withdrawn from Cuba. The property was left in care of our bankers and in immediate charge of a competent foreman with a few men. An effort was made to send our tug Colon to Jamaica for safe keeping, but the vessel was seized by the Spanish authorities and has since been in the service of the Spanish government. Steps have been taken looking toward the recovery of the tug by our navy department. Occasional cable advices were received indicating that quiet prevailed and that the property was in perfect order up to June 22. On that date Maj. Gen. William R. Shafter commenced landing a force of about 20,000 American soldiers on the property of this company at Daiquiri. Upon the approach of the Ameri-

has been rendered by our men. All of the hospitals have been burned by the American army. No damage has been done the mines, which remain in the same condition as when work was suspended.

"It is, of course, impossible at the moment to know the amount of loss which this company has sustained by reason of the property destroyed and the supplies appropriated by the Spanish and American armies. The loss probably approximates \$100,000. The machine shop was valued at \$35,000; the locomotives and engine house at \$20,000; the stock of lumber, coal, explosives and supplies at \$25,000; and other property was probably damaged to the extent of \$20,000. We do not include in the above the value of the tug Colon, \$20,000, as we hope to recover the vessel. Communication by mail has just been established, and more detailed reports will soon be received. Our assistant superintendent is now on his way to Cuba by arrangement with the war department, and steps will be taken immediately to repair the property and put it in operation as soon as conditions will admit. It is hoped that within sixty days a statement can be mailed to the stockholders announcing that the shipment of iron ore has been resumed."

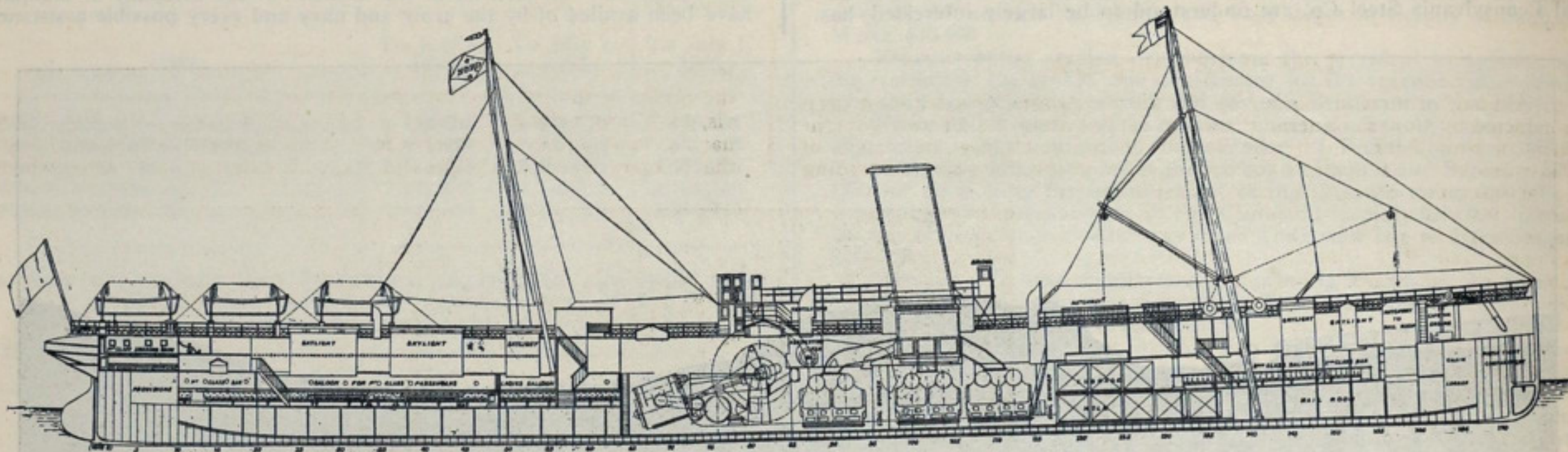
The wonderful performance of the United States battleship Oregon in steaming from San Francisco to Key West without a breakdown in her machinery, and reporting immediately upon her arrival for active service, is still winning admiration from all classes of engineers, particularly those interested in marine machinery. To have been able to make this record, it was absolutely essential that all parts of the machinery should be of the best. The superiority of hollow forgings over solid forgings in this case is made very apparent, as the crank shafts, line shaft, thrust shaft and propeller shaft were all made hollow, having a 6-inch hole through them. They were manufactured at the only forge in this country prepared to do work of this magnitude, namely, the Bethlehem Iron Co., South Bethlehem, Penna.



### Fast Side-Wheelers for English Channel Service.

We present herewith an illustration of one of the new fast side-wheel steamers, recently completed, and designed for service in the English channel by the Northern Railway Co. of France, whose concession for carrying the mails between France and England contains the provision that the new steamers must develop a minimum speed of 15 knots as a yearly average. These ships are to be essentially French, and their operation in the channel service will be watched with great interest, in view of the success attained by English-built side-wheelers in this same service. Several of the English ships have been described in the Review. Fifteen knots does not appear high, but a very fast vessel will be required to maintain such an average in all kinds of weather throughout the year. The two new French vessels, constructed by Forges & Chantiers, are 338 feet over all, 34 feet 9 inches beam, 68 feet 3 inches outside of paddle boxes and 16 feet 3 inches depth. There are two rudders in each of the ships, one aft, of the usual type, and the other forward, arranged so as not to interfere with the general profile of the hull. The latter is divided by nine watertight transverse bulkheads, rising as high as the main deck.

The engines are specified to develop 7,000 horse power and to give a speed of 21.5 knots. They are triple-expansion with three inclined cylinders driving direct on the wheelshaft by three cranks set at an angle of 120 degrees. The diameters of the cylinders are respectively 42.34 inches, 59.06 inches and 86.61 inches, with a stroke of 88.58 inches; these cylinders are steam jacketed and have a circulation of live steam from the boilers; the steam chests are cast in one with the cylinders; the valves are cylindrical and are four in number, the low-pressure cylinder having two; they are packed with cast-iron segments held out by springs. Besides the main engine there is a circulating apparatus consisting of two centrifugal



FAST SIDE WHEEL STEAMER FOR ENGLISH CHANNEL SERVICE.

pumps coupled on the same shafts and driven by a two-cylinder engine; there is a steam pump with a capacity of about 7,500 gallons per hour, which can draw either from the interior of the ship or from the sea. There is also a special steam steering gear controlling the port wheel; a feed-water heater fed by a special steam pump, and a dynamo driven by a Laval 30 horse power turbine for the electric lighting.

The wheels themselves are 22 feet 7 inches in diameter, with nine paddles 14 feet 1 inch long and 51 inches wide; the center, through which the shaft passes, as well as all the framework of the wheel, is of steel, and the paddles themselves are of steel plate slightly curved and stiffened by cover plates; the connections of the paddles with the framing are of bronze. The engines, which will run at a speed of fifty-two revolutions, are built upon steel foundation plates attached to the hull of the ship. There is a series of water tube boilers of the Lagrafel and D'Allest type; forward there are two double groups of eight boilers, and aft there are two groups of four boilers. The boilers are registered to work at 186 pounds per square inch; their grate surface is 516 square feet. The drawing presented is from Engineering of London.

### Wrecking Operations at Santiago.

Although reports seriously conflict as to just how many of the vessels of the fleet of Admiral Cervera may be saved with a view to utilization in the United States navy, the certainty is apparent that no time is to be lost in the wrecking operations. Even before the contracts had been signed the Merritt & Chapman Co. of New York had dispatched its tugs Right Arm, John G. Jones and J. J. Merritt to Santiago. Officials of the navy department have been disinclined to publish the provisions of the contract with the wrecking company, but according to information emanating from unofficial sources, it is similar to that for the recovery of the equipment of the Maine. The company, it is said, is guaranteed against loss from the capture of any of its vessels, and will receive a bounty for bringing any of the stranded ships north, amounting to about \$100,000 for each ship. The firm is paid a per diem rate, with 25 per cent. reduction for time occupied by the voyage to Santiago. The government paid the wrecking company \$781 per day for its work on the Maine, and the present contract is supposed to be at the same figure.

In a letter to the Review Mr. I. J. Merritt, Jr., treasurer of the Merritt & Chapman Co., states that the company has not as yet received any particulars regarding the extent of damage to the vessels, but that a large force of men, consisting of wreck masters, foremen, engineers, divers and wreckers, together with a full equipment of steam pumps, boilers, cables and anchors, has been dispatched south. At the head of the force is Capt. Frederick Sharp, an expert diver, who had charge of the company's forces when work was carried on on the Maine.

### Contract for Three Large Coasting Steamers.

President C. B. Orcutt of the Newport News Ship Building & Dry Dock Co. informs the Review that the predictions relative to the probability of the company securing a handsome contract from the Morgan line have been justified, negotiations to that end having been closed, although the contract is for three instead of four steamers, as reported in some newspapers, the new vessels being designed to replace the El Norte, El Sid and El Sud, now the auxiliary cruisers Dixey, Yosemite and Yankee. The Newport News company has already placed contracts with the Carnegie Steel Co. for \$25,000 tons of material to be used in the construction of the vessels. These steamers will each be 406 feet over all, 48 feet beam and 33 feet 9 inches depth. They will have three decks and a partial orlop deck at the fore end of forehold, the upper deck to be an awning deck. The masts are to be of steel. Power for propulsion will be furnished in each case by a triple expansion surface condensing, direct-acting engine, with inverted cylinders, working on cranks at angles of 120 degrees. The general design and arrangement will be the same as that of steamer El Rio. Working steam pressure 165 pounds. The cylinders will be 32, 52 and 84 inches diameter, with a stroke of 54 inches. Three double-ended cylindrical boilers, 13 feet 10 inches mean diameter and 20 feet 6 inches long. Six circular corrugated furnaces, about 44 inches inner diameter, with combustion chamber common to all. Grate bars 6½ feet long. Tubes 3¼ inches diameter. Auxiliary machinery on these vessels will, of course, be modern in all respects, including windlasses of the kind manufactured by the American Ship Windlass Co. The Newport News Co. is also understood to be figuring on two steamers for the Cromwell line.

Now that the 140-ton traveling crane Hercules at the Newport News yard has been completed, construction work on the battleships Kearsarge

and Kentucky can be pushed more rapidly than ever. These vessels will be practically finished by Jan. 1, the contract time of completion, but the company may ask for a short extension, in order that it may not be necessary to hurry the work of putting on the finishing touches. The armor plate for the Illinois is yet to be delivered, and it is not expected that any of it will be on hand before the vessel is launched, about Sept. 15. Preparations, it is stated, are already being made for commencing work on the new dry dock and a portion of the material has been ordered, although delivery will not commence for a month yet. The dock will cost \$1,000,000 and will be the largest in the world, holding two first-class battleships at the same time. The dock was designed by General Manager W. A. Post and his plans are understood to have met the entire approval of Mr. Collis P. Huntington and the navy department. Other improvements are also under way by which it may be seen that the Newport News Co. intends to be ready to reap the greatest possible degree of benefit from the improvement in ship building which will assuredly follow the present war. The old rumor to the effect that Sir William Armstrong, the well-known London gun manufacturer, will purchase an interest in the Newport News yard is revived periodically, but officials of the company have never confirmed the report in any degree.

### Strike Off at South Chicago.

Chicago, Ill., July 13.—The Menominee line steamer Saxon, which is engaged in the Canada Atlantic line service between this port and Parry sound, left the works of the Chicago Ship Building Co., yesterday, after completing repairs made necessary by striking in Georgian bay. The job included forty-three new frames, fourteen new floors and twenty new shell plates. The floors were cut out with the pneumatic tools, and the machines were also used for riveting. Shell rivets were backed out by both machine and hand work and the riveting similarly carried out. As the strike is over with, in favor of the ship building company, the few riveting gangs that have been taken on are now working side by side with the machines. The job on the Saxon was very neatly carried out, and it is clearly evident that ship yards throughout the country will all soon be using the tools to the extent that they are now used here on all kinds of work.

An exhibit that attracted universal attention at the recent conventions at Saratoga was that of the Chicago Pneumatic Tool Co. of Chicago, which displayed a most complete collection of pneumatic tools and appliances of every description. All the tools shown were exhibited in actual operation, air pressure being furnished by a Rand compressor with cylinder 10 by 14 inches and capable of furnishing 300 feet of air per minute. Among the tools shown were hammers, drills, flue rollers, air hoists, sand papering machines, drill presses, stay bolt cutters, etc., all indicating the great variety of work other than that of ship yards, to which the Chicago company's tools are applied.



### No Tax on Charters.

Although the United States commissioner of internal revenue has not as yet made public his decision regarding that feature of the war revenue act relating to a tax on the charter of vessels engaged in the commerce of the lakes, and other internal commerce throughout the United States, Mr. Harvey D. Goulder of Cleveland, who has had the matter in hand for the Lake Carriers' Association, is now fully satisfied, from correspondence which he has had with Washington, that the decision will be in accordance with the intent of the law, and that no tax of any kind will be collected on charters of vessels engaged in internal commerce. As shown by a summary of the brief presented by Mr. Goulder to the government officials, which appeared in the last issue of the Review, this matter has been handled very carefully for the Lake Carriers' Association, and the owners of vessels engaged in internal commerce in all parts of the United States have reason to feel thankful that their interests have also been served by the lake organization. Dispatches from Washington in the daily newspapers regarding the decision of the internal revenue department must certainly be annoying to representatives of lake interests in Washington, as well as the officials of the Lake Carriers' Association. In one of them it is said that "the ruling is much more favorable than Mr. Goulder and the Lake Carriers' Association had reason to expect." This is nonsense, as it was clearly evident from the statement of the case that was made to government officials that the vessel owners had every reason to expect just such a ruling as has been made in the matter. In another part of one of the Washington dispatches appears this sentence: "Mr. Goulder wanted to know whether owners of vessels engaged in lake commerce were taxable for every charter taken, or whether the tax was to be assessed by the season." This is equally absurd as to admit that the tax would apply on season contracts and not on charters from one trip to another would be a very feeble argument.

### Loss of La Bourgogne.

Although courts of inquiry on the La Bourgogne disaster have been conducted by Consul General Bruwaert, representing the French government in New York, and by the British officials at Halifax, the details of cause and effect developed have been meager in the extreme. According to the testimony brought out in the first-mentioned investigation, the French liner listed to starboard soon after the machinery was stopped, and then suddenly pitched stern downward and sank. The French sailors swore that the compartment doors were closed. The story submitted to the British wreck commission by Capt. Henderson of the Cromartyshire is very generally coherent. He asserted that he was sailing slowly and sounding his fog signal. The prow of the French steamer struck the Cromartyshire a quick glancing blow that cut her down to her collision bulkhead. It would seem, however, from the information obtainable at this time, that La Bourgogne violated rule 16 of the international rules, which require a vessel in a fog to go at a moderate rate of speed, constantly sounding her fog horn, whether other vessels are heard in the vicinity or not. Some of the reports have estimated the speed of the French liner at the time of the collision as 17 knots, while the courts held in the case of La Normandie that 10 knots was excessive. Rule 16 goes even farther and provides that a steam vessel hearing apparently forward of her beam the fog signal of a vessel, the position of which is not ascertained, shall, so far as the circumstances admit, stop her engines altogether. She may then navigate with caution until the danger of collision is past. Under the circumstances there would seem to be a strong probability that the Cromartyshire will bring suit against the French line in some English court, but this would undoubtedly be followed by a cross-libel and extended general litigation. The surviving members of the crew of La Bourgogne have made the most emphatic denials of the charges brought against them relative to their conduct towards passengers after the collision, but the fact remains that of the 503 passengers on the lost vessel all but sixty-one were drowned, while of 222 officers and crew 104 saved themselves. Certainly a considerable degree of credulousness is required for the belief that this happened by chance.

The disaster again calls attention to the fact that naval architects do not seem to be much nearer a solution of the question of the protection of passenger ships against sinking, notwithstanding all that has been done towards providing them with bulkheads, water-tight compartments, etc. The circumstances under which the Ville du Havre of the French line was run down were almost identical with those of the recent accident. The Ville du Havre was hit by the iron British ship Loch Earn in a fog in midocean, Nov. 23, 1873, almost cutting her in two, the foundering resulting in the loss of eighty-three lives. The vicinity of Sable island, where La Bourgogne went down, was the scene on August 13, 1888, of the collision between the Geiser of the Thingvalla line and the Thingvalla, a sister ship, seventy-three passengers and thirty-three of the crew of the former being lost. The foundering on Jan. 30, 1895, of the North German Lloyd steamer Elbe in the North Sea after being rammed by the British steamship Crathie is well remembered.

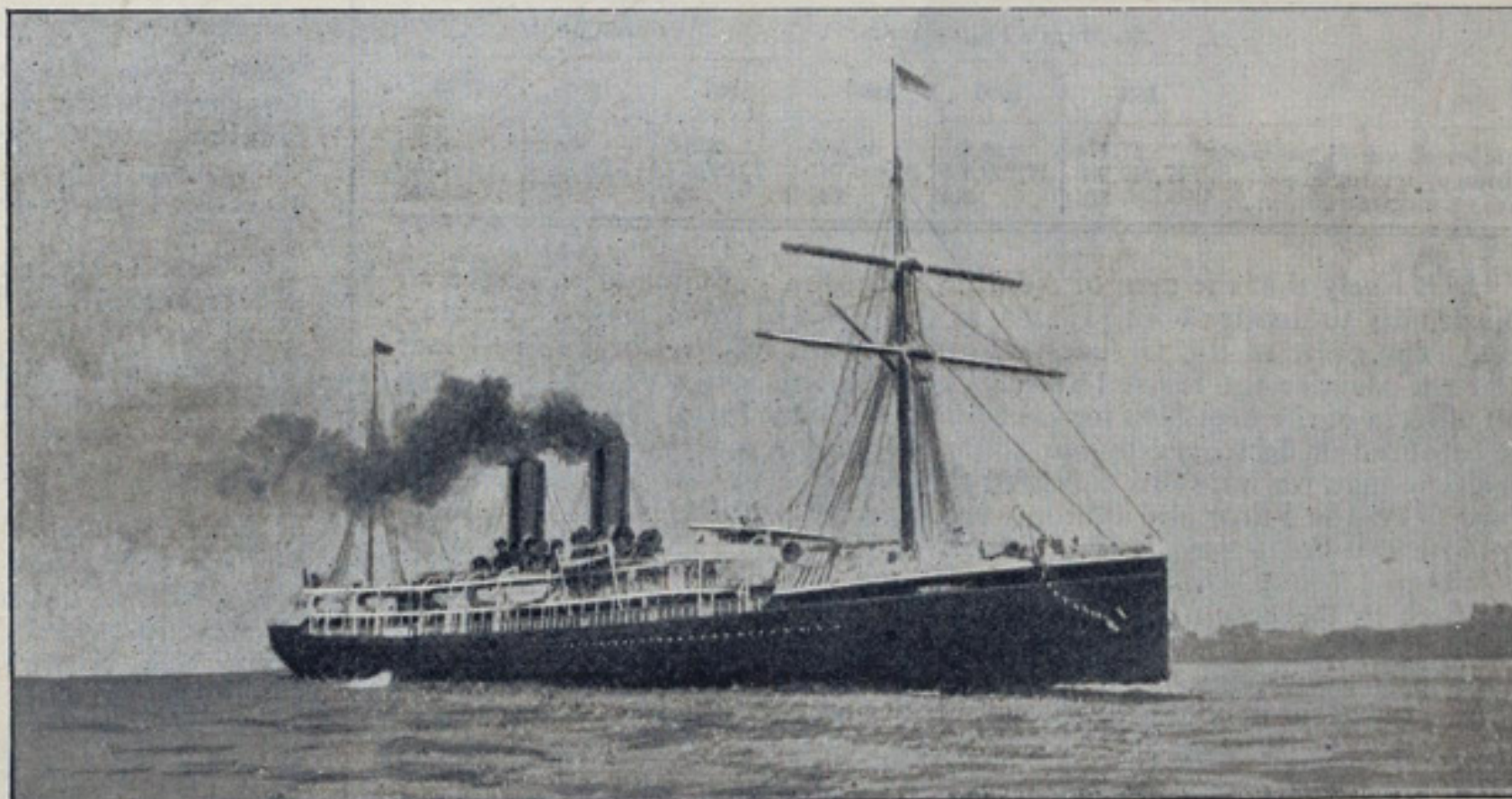
Otis, Hough & Co. of Cleveland, with offices in the Cuyahoga building, have secured the agency for the Otis Steel Co.'s steel plate. Their territory will cover the state of Ohio.

Get particulars from agents regarding \$1.00 excursion tickets offered for sale by the Nickel Plate road on Sundays, to parties of five or more.

### Plans of Deep Waterways Commission.

The passage of the sundry civil appropriation bill, noted elsewhere in this issue, with its appropriation of \$225,000 for the furtherance of the work of the Deep Waterways Commission, or as it will in future be known, the United States Board of Engineers on Deep Waterways, has enabled the members of that body to map out their plans with some degree of definiteness. Members of this commission are Major Raymond of the army engineer corps, Philadelphia; Geo. Y. Wisner of Detroit, and Alfred Noble of Chicago. As has been stated previously, the general arrangement contemplates the completion of field work on all the ship canal surveys as speedily as possible, viz: the Niagara ship canal, the Oswego-Mohawk route, and the St. Lawrence-Champlain route. Months will be required to reduce the field notes, develop routes, devise plans and make estimates of cost, and it seems doubtful whether it will be possible to carry out the stipulation tacked to the appropriation clause, which requires a full report at the opening of the next session of congress. The course that the engineers will probably pursue will be to report at the stipulated time that the field work of surveys has been completed, with a report on the Niagara route and possibly a plan for the regulation of lake levels.

It is now expected that the surveys of the Oswego-Mohawk route and of the route from Lake Champlain to the Hudson river at Troy will be completed about Nov. 1. A party is now being organized to make a survey of the route from Lake Champlain to the St. Lawrence, by Mr. F. P. Davis of Washington. It is hoped that it will be possible to complete the field work of this survey this year, but owing to the advanced season this may be impossible. Mr. James Ritchie, M. Am. Soc. C. E., of Cleveland, has been appointed to take charge of the survey of the head of Niagara river and of Ollcott harbor, and will organize a party at once. Two other small parties, one to make an examination of the Hudson river from Troy to deep water at Hudson, and the other to make a survey of the rapids of the St. Lawrence between Ogdensburg and Lake St. Francis, have been arranged for and will soon be at work. The board is also having some additional observations made to determine the discharge of the Niagara river for the present stage of water in Lake Erie, which is



(From Illustrated Buffalo Express. Copyright, 1898.)

FRENCH LINER LA BOURGOGNE, LOST JULY 4 WITH 500 LIVES.

about a foot higher than when the work was done last autumn. It is the desire of the board to complete all field work this year, if it is at all possible.

The members of the board are much relieved that the clause governing the appropriation just made only requires estimates on depths of 21 and 30 feet. The bill as originally amended in the senate called for a report on the probable and relative cost of depths of 12, 18, 21, 26 and 30 feet, which would, of course, have entailed endless additional work.

### Around the Lakes.

The ashes of Capt. Charles V. Gridley, late commander of Dewey's flagship Olympia, arrived at his home at Erie, Pa., this week, and interment was made at Lakeside cemetery at sunset, Wednesday. The remains were escorted by a detachment of sailors from the light-house tender Haze and the U. S. S. Michigan. The bell in the city hall tower, a relic captured from the British by Perry, was tolled during the funeral ceremonies.

The Canadian marine department announces that a fixed white light has been established by Joseph Rouleau, pilot, to mark the southern edge of the dredged curve opposite the beacon in the upper entrance to the Canadian canal at the Sault. The light is shown from a buoy or float moored near the black spar buoy maintained by the Canadian government.

Capt. J. D. Peterson of the steamer Lockwood has the sympathy of associates on the lakes in the death of Mrs. Peterson, which was announced from the family home at Huron, O., on Saturday last.

John Craig of the Craig Ship Building Co., Toledo, has just returned from Seattle, where he went to put together a tug that was built at Toledo for Yukon river service and shipped by rail to Seattle. Mr. Craig says that the ship from the Klondike region expected daily in Seattle now may bring anywhere from two to ten millions of gold, and he is of the opinion that after her arrival excitement will again run high among the gold seekers.





DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

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binders sent, post paid, \$1.00. Advertising rates on application.

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The books of the United States treasury department on June 30, 1897, contained the names of 3,230 vessels, of 1,410,102.60 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1897, was 399, and their aggregate gross tonnage 769,366.68; the number of vessels of this class owned in all other parts of the country on the same date was 314, and their tonnage 685,709.07, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1897, was as follows.

	Number.	Gross Tonnage.
Steam vessels .....	1,775	777,235.45
Sailing vessels and barges.....	1,094	894,888.87
Canal boats .....	361	37,978.28
<b>Total .....</b>	<b>3,230</b>	<b>1,410,102.60</b>

The gross registered tonnage of the vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
" " " 1896.....	117	108,782.33
" " " 1897.....	120	116,936.98
<b>Total .....</b>	<b>611</b>	<b>403,327.91</b>

ST. MARY'S FALLS AND SUZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canals.			Suez Canal.		
	1897	1896	1895	1897	1896	1895
Number of vessel passages.....	17,171	18,615	17,956	2,986	3,409	3,434
Tonnage, net registered.....	17,619,933	17,249,418	16,806,781	7,899,374	8,500,284	8,448,383
Days of navigation.....	234	232	231	365	365	365

It is likely that the men of Admiral Sampson's command will have an opportunity to divide about \$170,000 as the result of the defeat of Cervera's fleet. The crew of the Gloucester, formerly the yacht Corsair, will fare the best. Under the revised statutes the United States pays to the men and officers of the fleet \$100 for every man on the ships of the enemy which are captured or destroyed by our ships of equal or superior force, and \$200 for every man on warships captured or destroyed by our ships of inferior power. As the Furor and Pluton were superior to the Corsair, the bounty on those two boats may be \$200 a man. The complement of the two ships was about 135 men, or \$27,000. The bounty is divided as follows: One-twentieth to the commanding officer of the fleet, one-fiftieth to the commanding officer of the division of the fleet; one one-thousandth to the fleet captain, one-tenth of each ship's share to the commander of that ship; the remainder to be apportioned among the officers and men according to their pay.

Whatever interest has been aroused by the recent sinking of large cribs in various parts of the country will extend to the one just put down as a protection for the foundation of an extension of the grain elevator of the Philadelphia Grain Elevator Co. at Port Richmond, Pa. The crib, which is 128 feet long by 102 feet wide at the bottom and tapering to a width of 101 feet at the top, rests upon a solid foundation, excavated by means of dredges 30 feet below the bed of the river. Three hundred tons of stone and 600 tons of gravel were placed in the crib to sink it. In the crib there are seventy compartments, in each of which fifteen piles will be driven to form the foundation upon which the new elevator is to be built, the crib simply serving as a protection from the ice and vessels to the piling.

The highest strength ever reached by the navy in peace times was secured last January, when the number approximated 11,500. Since then it has been almost doubled, and is to continue on the increase until every ship now preparing for service has a crew on board. Enlistments are to continue until the strength reaches probably 25,000. Crews are yet required for the Buffalo, the Philadelphia, now fitting for service, and the Chicago and Atlanta, to be ready for service later. The Yorktown, Ranger and Alert also require full complements. Of the men all but 1,000 are on ships in service, the few not at sea being necessary for work at navy yards that only sailors can perform.—Army and Navy Journal.

A sarcastic writer in the Shipping World, London, comments as follows: "I should like to see some proof of solid patriotism, and, therefore, am curious to learn how it is that a well-known firm of auctioneers is able to announce that on the 23d inst. 'the sword presented to Lord Nelson by the ships engaged at the Battle of the Nile' will be put for sale. The blade is inscribed 'For my country and king.' How such a relic has come within reach of the saleroom hammer I cannot fathom. I should not be surprised to learn that some enthusiastic American secured the trophy and handed it over to Lieutenant Hobson of the Merrimac."

There appears to be little or no foundation for the report that officials of the United States navy contemplate a revival of the proviso in contracts for war vessels for the payment of speed premiums. No more severe denunciation of this practice has been made than that of Rear Admiral Gherardi, who a few days ago asserted that speed premium tests often

resulted in irreparable injury to the boilers and machinery of war ships. One such test, he asserted, was more injurious to a battleship than three years of hard service, claiming that it would be far better after those tremendous tests to rip out the boilers and engines and put new ones in.

So far no heed has been taken by the Canadian government to the formal protest made by Spain against allowing the United States revenue cutters to pass through the Canadian canals, on the ground that it is a violation of the neutrality laws. Had the Dominion government so desired, it would have been possible, of course, to stop the Gresham in accordance with such a protest, but the cutters Algonquin and Onondaga will, until they reach Montreal, be considered the property of the Globe Iron Works Co. of Cleveland, the builders.

Progress of ship building in Germany is well illustrated by the following statistical summary: From 1871 to 1880 the ten leading ship yards of Germany turned out new vessels aggregating in value \$1,625,000; from 1881 to 1890 the aggregate was \$21,975,000; and finally, from 1891 to 1896, a period only a little more than half as long as those preceding, the total value of output had risen to \$257,500,000. German ship yards which, on June 5, 1882, gave employment to 23,000 men, had, on June 14, 1897, in their employ over 35,000 hands.

Statistics compiled by the treasury department emphasize the decline in iron ore imports to the United States, due in part to the disturbed condition of affairs in Cuba. During the month of May only 11,776 tons of ore were imported, as compared with 41,717 tons in May, 1897. In the eleven months ending with May, the total imports were 352,305 tons, as against 510,991 tons in the corresponding period preceding. Lake Superior ores will be required to make up the deficiency.

The completion by the Elswick Co. in England of the Japanese cruiser Takasago, which for her tonnage is vastly superior in fighting qualities to any similar cruiser in the British navy, has revived a general discussion in English naval circles as to the explanation of the frequently demonstrated fact that more powerfully armed and faster cruisers can be built by private companies than can be produced by the British admiralty from official designs.

The work done during 1897 by the British hydrographic service, as shown by reports just compiled, was of no mean magnitude. There were engaged on the work eleven vessels, four in home waters and seven in foreign waters. Seventy-five officers have been employed, including fifty surveying officers, and men to the number of 639. During the year 190 rocks and shoals dangerous to navigation were discovered and reported.

Gen. Tracy, ex-secretary of the navy, contends that the three United States battleships, Indiana, Massachusetts and Oregon, with their 13-inch guns, are the most powerful in the world. There are 16-inch guns mounted on some of the Italian vessels, but he says that they are not to be considered seriously, maintaining that no vessel afloat has defensive qualities that will compare with those afforded by the 18-inch Harveyized armor on the three battleships mentioned.

Mr. Stephen R. Kirby informs the Review that the invention on which he is working, and mention of which was made in this paper last week, is designed for the use of the average navigator in the mercantile marine service, instead of for naval officials, as might have been inferred by our note. Mr. Kirby says that it is only the every-day navigator who requires such an instrument.

A cablegram announces that Col. A. J. Drexel's steam yacht Margarita has been sold to King Leopold of Belgium. Her former owner started this year on a cruise around the world, but it had to be abandoned on account of the war. The Margarita was built in Scotland in 1896, and is 278 feet over all, 33 feet beam, 20 feet depth and 15 feet draught. She has a speed of 17 knots.

One of the latest of the French ironclads, the Charlemagne, a triple-screw ship, recently developed 11,460 horse power with natural draft and at 120 revolutions. The speed was 17.25 knots. It is claimed in reports of the trial that this speed can be maintained at sea. With forced draft the vessel developed 14,500 horse power, and a trifle over 18 knots.

#### Activity at the Cramp Ship Yard.

Philadelphia, Pa., July 13.—Seldom in the history of the William Cramp & Sons Ship & Engine Building Co. has there been greater activity in every portion of their plant at Philadelphia than at present. The immediate event of most importance is the official trial of the Japanese cruiser Kasagi, which is expected to take place tomorrow (Thursday) off the Massachusetts coast. The vessel left the Cramps' yard last Saturday. The course is laid out between Boone island and Cape Porpoise. Capt. Sargent of the Cramp company navigates the vessel, and Charles H. Cramp assists in the direction of the cruiser on all tests of speed. Harry Mull is in charge of the engines and Capt. Rashomedra and Lieut. Commander K. Imochie of the Japanese navy represent that government on board. The contract speed of the vessel is 22½ knots, but inasmuch as she made 23 knots on her builder's trial, there is a likelihood that on her 24-mile straightaway test of speed the Kasagi will develop 23½ knots, which would make her the fastest vessel of her type afloat. The battleship Alabama, under construction at the Cramp yard, is about 33 per cent. completed, and good progress is being made on the four vessels for the Quaker City Fruit Co. A steamer for the Ward company is on the stocks, and this latter firm is so well pleased with the rapid work done that it has awarded the company a contract for a second vessel, the keel of which will soon be laid. Officials of the Cramp company would, of course, be pleased to undertake the reconstruction of any of the Spanish cruisers at Santiago that can be saved, and, alike to other builders, are undoubtedly figuring on securing a portion of this work if any of the vessels are recovered.



### Ship Builders on the Naval Victories.

Ship builders generally throughout the country seem to entertain no doubt as to the beneficial effect upon the industry which will be induced by the recent victory of the American over the Spanish fleet at Santiago. Mr. Charles H. Cramp of the William Cramp & Sons Ship & Engine Building Co. is reported as saying in a discussion of this topic: "The three cardinal points to be covered in a warship are offense, defense and sea-keeping power. The advantage of speed for both the Spanish and our own navy was much impaired by the condition of the ships. The last battle has not settled the question of the battleship against the cruiser, for the reason which I have just mentioned, and for the further reason that American gunners were much the better marksmen. The thoroughly satisfactory way in which the turrets of the vessels engaged worked is a source of great satisfaction to me. The problem of the turret was an important factor to be demonstrated in its application to modern warships, and this naval action has settled that question." Mr. Cramp seems to regard the torpedo boat question as still unsolved.

Mr. Lewis Nixon seemingly takes even a more optimistic view of the situation. His attributed verdict was couched in the following language: "The victory at Santiago will unquestionably increase the ship building output of this country. The achievement of our navy has turned all eyes toward the seas, and capitalists who never thought of looking in that direction will invest their money in maritime projects and get a liberal return. I believe that the development of the transpacific trade will show surprising results. With the acquisition of Hawaii and the Philippines, there is bound to be a big boom on the Pacific. Ships must be built for this traffic, and those ships will be of American construction."

### Pontooning Vessels Through the St. Lawrence.

The operation of cutting in two large steel vessels like the United States revenue cutters Gresham and Algonquin, in order to permit of their passage through the St. Lawrence canals to the Atlantic seaboard, and the announcement that a similar method of procedure will be necessary in the case of the revenue cutter Onondaga, building at Cleveland, which will also be taken over by the navy department on reaching the Atlantic, has again directed attention to this class of work and has emphasized the skill and care necessary for its satisfactory performance. When the steel steamers Mackinaw and Keweenaw, built at West Bay City, Mich., were taken through the St. Lawrence in this way, a few years ago, the success of the work and the simple manner in which it was performed was surprising to some vessel men. Since that time a large number of vessels—whalebacks, light-ships, tugs built for ocean service, oil barges, etc.—all of them of greater draught than is found in two or three of the canals at present, and some of them of larger dimensions than the canal locks, have been successfully moved to the seaboard. In the case of vessels of dimensions larger than the locks, it has been necessary, of course, to cut them in two, but where depth of water was all that was to be taken into consideration, the vessels have been raised on pontoons.

There are three or four concerns that are equipped for this kind of work and that undertake contracts in which they agree to deliver the vessels safely through the canals and below the shallow parts of the river. They usually act jointly with the ship builders when it is necessary to cut a vessel in two. The accompanying illustration shows the sea-going tug W. H. Brown while being pontooned through the canals from the lakes through to the seaboard. This work was performed by the Collins Bay Rafting & Forwarding Co., Limited, of Collins Bay, Ont. The tug Brown was built by F. W. Wheeler & Co. of West Bay City, and is now one of the auxiliary naval fleet. Another tug built at West Bay City, the Wilmot, was taken through the St. Lawrence in the same way by the Collins Bay company. This company also successfully conducted the work of cutting in two, pontooning through the canals and erecting at Montreal the steamer Campana, as well as a light-ship for the government that was built on the lakes but intended for Atlantic coast service. Few vessel men perhaps realize the extent of equipment necessary to cope with the various lines of work that may be required in undertaking contracts of this kind. The Collins Bay company has wrecking tugs, steel pontoons, steam pumps, divers' outfits, etc., and engages in the recovery of wrecks, in submarine work, and in freighting contracts. The business of pontooning vessels through the canals has been developed in connection with other interests of this company. It could only be made successful by such a concern, as there is not enough work in this one line to warrant the maintenance of the necessary equipment.

That greatest of rareties, a port which a British vessel does not enter, has been discovered. The British consul at Pakhoi, China, reports that of the 107 steamers which visited the harbor in 1897, forty-two were German, thirty-nine French and twenty-six Danish.

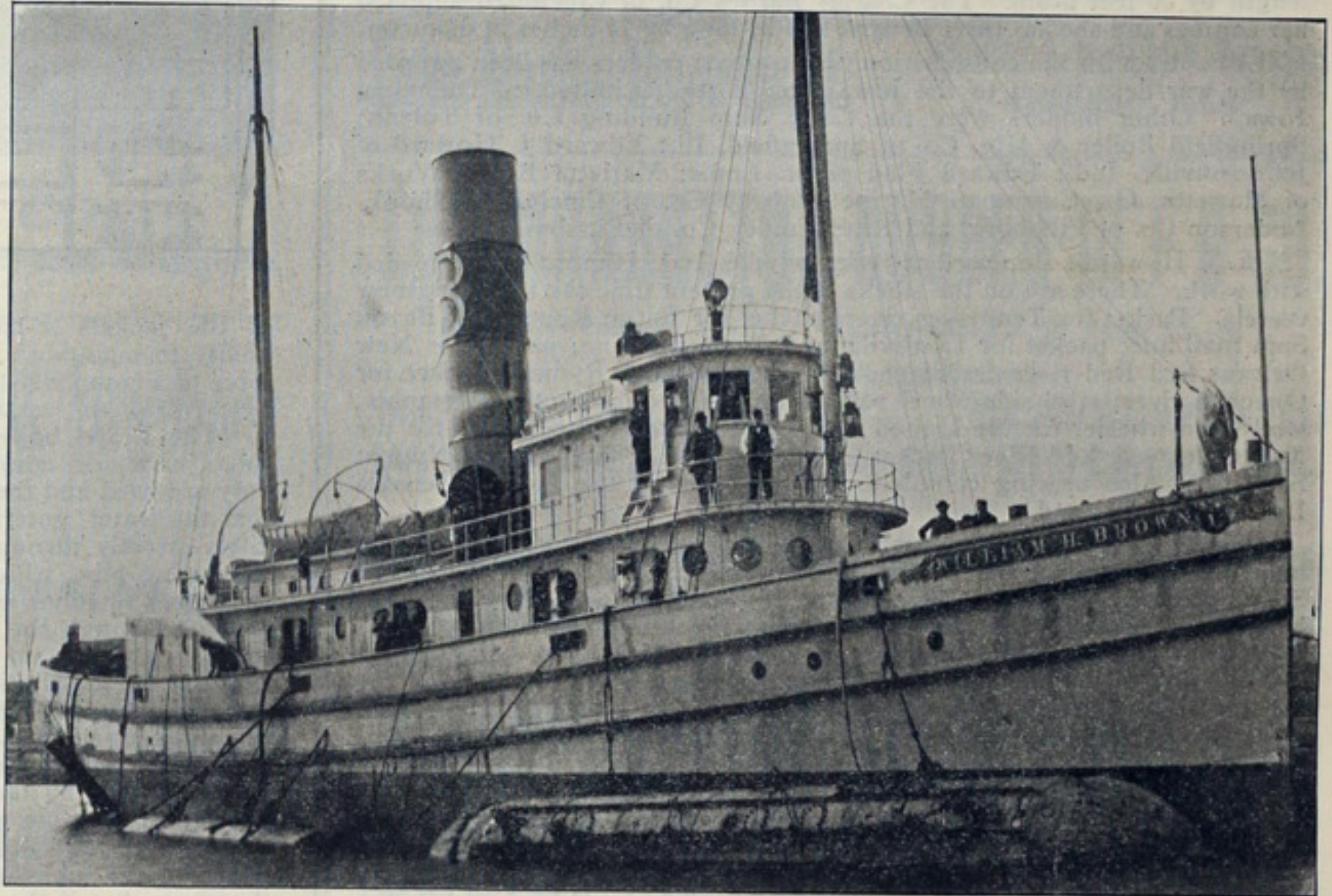
A new chart of Erie harbor and Presque Isle on a large scale, showing all the docks, has just been prepared by the government engineers. The chart is from a survey of July-September, 1896, made under the direction of Major T. W. Symons, United States engineer in charge of the Buffalo district. Corrections have been carried up to the present time. Copies may be had from the Marine Review at 50 cents each.

### Limit of Detroit River Draught.

Notwithstanding that many vessels drawing approximately 18 feet have passed down the Detroit river this season without accident, the fact remains that the trip, except under the most favorable conditions of wind, etc., is fraught with danger for vessels of that draught. Many masters have, either on their own account or in compliance with orders from their owners, adopted the plan of ascertaining from Duff & Gatfield the stage of water before undertaking the passage. With reference to the recent striking of the steamer Maritana, abreast Amherstburg, it has been learned from the latter place that there is at the ordinary stage of water a clear depth of 18 feet along the new ranges and for 100 feet on either side of them, but on the evening on which this accident occurred (June 28), the water was unusually low for this time of year, being .40 below zero, with the wind northwest, fresh. This would leave a clear depth at the time of 17.6 feet. The entire stretch along this range has been swept this spring and many boulders removed, but the least depth is still 18 feet, and this cannot be improved until dredging is done. The dredging abreast Amherstburg is progressing slowly, inasmuch as much hard digging has been found. So far as can be learned, however, vessels have sustained no damage by reason of the obstructions thrown up in dredging.

### British Navigation Statistics for 1897.

The bigness of the British ship building industry and the mercantile marine of that nation is strikingly illustrated by the "annual statement of the navigation and shipping of the United Kingdom for the year 1897," which has just been published. The number of vessels which arrived at all ports in the United Kingdom, over sea and coastwise, during the year is shown to have been 394,464, representing an aggregate tonnage of 101,442,082 tons, as compared with 397,090 vessels of 98,093,454 tons in 1896. Of these 29,818 vessels, of 14,635,322 tons, were foreign, and the remainder British. The total number of vessels remaining on the registers at ports in the United Kingdom and British possessions abroad on Dec. 31, 1897, was 34,962, representing in the aggregate 10,416,442 tons, as compared with 35,735 vessels, of 10,503,307 tons in 1896. During the year 1,054 vessels,



PONTOONS UNDER A LAKE-BUILT TUG IN THE ST. LAWRENCE.

of 482,267 net registered tons, were built in the United Kingdom for British owners, and 229 vessels, of 162,430 tons, for foreigners. In 1896 there were built for home account 931 vessels of 519,790 tons. From a table which shows the number and tonnage of the vessels of all classes that entered and cleared from the various ports during the year, we extract the following:

TOTAL ENTRIES AND CLEARINGS		Net registered
Port.	Ships.	tonnage.
*London .....	79,528	25,009,789
Liverpool .....	39,359	17,913,989
Cardiff .....	31,200	17,824,930
Tyne ports .....	28,487	15,471,577
Glasgow .....	20,934	7,073,424
Hull .....	11,295	5,516,007
Southampton .....	24,228	5,435,754
Sunderland .....	14,041	5,299,683
Belfast .....	21,987	4,971,457
Dublin .....	16,455	4,846,854
Newport .....	16,537	4,816,849
Middlesborough .....	7,472	3,752,703
Greenock .....	18,333	3,549,927
Portsmouth .....	28,217	3,212,478
Leith .....	8,472	3,167,332
Swansea .....	11,457	3,119,693
Manchester .....	10,169	2,301,269

\*It has not been found possible to keep a record of the ships clearing from London in ballast coastwise, and these are therefore not included in the total.



### New Business in the Ship Yards.

Messrs. Orrin and John Holt of Dummer, N. H., are building a ferryboat.

W. H. Glover & Co. of Rockland, Me., have the contract for the erection of a life-saving station at Hampton Beach.

The Hillman Ship & Engine Building Co. of Philadelphia has laid the keel for the new tug for the Standard Oil Co.

Work is well under way on a tug being built for George Hall by the St. Lawrence Marine Railway Co. of Ogdensburg.

The Jackson & Sharp Co., Wilmington, Del., has received a contract for two lighters 100 feet in length, 31 feet beam and 8½ feet in depth.

The tug President, building by Capt. E. Brandow at Tompkins Cove, N. Y., was launched a few days ago. She is designed for New York harbor work.

The Burlee Dry Dock Co. of Port Richmond, S. I., has secured a contract for a harbor lighter for the National Lead Co. of New York. The craft will be 80 feet in length, 30 feet breadth and 10 feet depth.

The Winifred, famous as the only American "tramp" steamer, was launched at the yard of the Bath Iron Works Co. at Bath, Me., a few days ago. She is 305 feet over all, 42 feet beam and 25 feet depth; triple expansion engine and two Scotch boilers.

A yacht launched from the Roach ship yard at Chester, Pa., last week, and which has been purchased by the United States government, will be known as the Sylph, and will be used as a patrol boat. She is 126 feet in length by 20 feet beam by 10 feet depth.

A disinfecting barge, under construction by the Kensington Engine Works of Philadelphia, is well on the way to completion. This is the first vessel ever built by the government especially for quarantine purposes. Heretofore hulks of other vessels have been transformed into quarantine vessels.

The steamer St. James, recently launched at the Cincinnati Marine Ways and designed for the New Orleans and St. James Parish trade, will be one of the finest river steamboats ever constructed. She is 185 feet in length by 35 feet beam. The Charles Barnes Co. of Cincinnati supplied her engines and she has three boilers, 26 feet long by 44 inches in diameter.

A contract for the construction of five steam tenders has been awarded by the war department to the Iowa Iron Works, Limited, of Dubuque, Iowa. Other bidders were the Craig Ship Building Co. of Toledo; Springfield Boiler & Mfg. Co. of Springfield, Ill.; Edward J. Howard of Jeffersonville, Ind.; Edward Flad of St. Louis; Marietta Boiler Works of Marietta, O.; Cincinnati Marine Railway Co. of Cincinnati; Shook-Anderson Co. of Pittsburg, and Riter-Conley Co. of Pittsburg.

E. J. Howard's ship yard at Jeffersonville, Ind., is more than crowded with work. There are on the stocks at the present time the following new vessels. Packet for Tennessee river; packet for Baton Rouge and Bayou Sara mail line; packet for Louisville and Cincinnati line; packet for New Orleans and Red river trade; packet for Capt. Tom Ryman; packet for Ouachita river; steel side-wheel packet for the Lee line out of Memphis; steel stern-wheeler for the United States government; two barges for the New Orleans & Red River Packet Co., and a floating dock for the Nugent Sand Co. Also nearing completion at the yard are the packets Georgia Lee and Cumberland.

The Harlan & Hollingsworth Co., Wilmington, Del., has successfully launched the steamer Tennessee, under construction for the Baltimore Steam Packet Co. She is 245 feet long, 38 feet wide and 15 feet deep, and her twin screws are driven by two triple expansion engines, with cylinders 18, 28 and 35 inches, and 30-inch stroke; four Scotch boilers, with a working pressure of 160 pounds. This company has a contract for a large tug for the Luckenbach Towing Co.—150 feet long and of 1,000 horse power.

One of the finest steamers as yet launched at the Roach yard, Chester, Pa., is the Cape Charles, which slid into the water a few days ago. The vessel is building for the New York, Philadelphia & Norfolk Railroad Co. and is 133 feet long, 41 feet beam and 15 feet depth. Engines are triple expansion with cylinders 19, 32 and 50 inches diameter and 28-inch stroke. Steam will be furnished by two boilers, 13 feet in diameter, at a working steam pressure of about 170 pounds. The vessel is provided with an entire outfit of Blake pumps, including independent air pumps, which are of the well-known Blake vertical twin type, such as have been furnished to United States cruisers and battleships.

### Shoals, Buoys, etc.—Spot Named for the Minneapolis.

Inspector C. O. Allibone of the ninth light-house district (headquarters at Chicago) displayed commendable promptness in the expeditious manner in which he discovered the shoal in Green bay upon which Capt. William Jamieson of the steamer Minneapolis reported that his vessel had struck on June 3. Commander Allibone has sent out a notice to the effect that a 30-foot red and black horizontal striped spar buoy was established on July 8 at this spot, which will henceforth be known as Minneapolis shoal. The buoy is in 17½ feet of water and marks the center of a rocky shoal (17½ feet least depth). Vessels, it is stated, should give this buoy a berth of at least ¼ mile.

The light-house board announces that on July 15 the flashing of the light on Wind point, Lake Michigan, will be discontinued for ten days for repairs to illuminating apparatus. During that period the light will show fixed white.

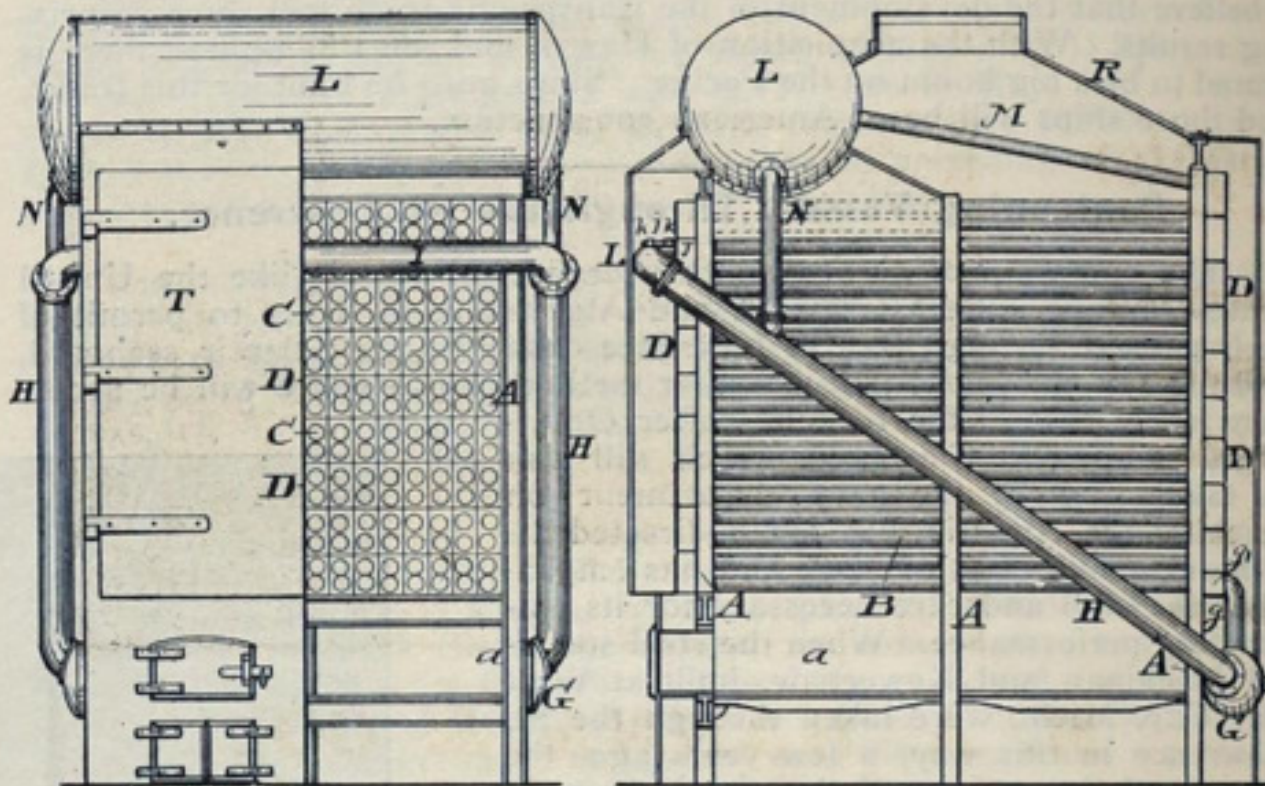
A fixed white light of the fifth order will be established in the tower recently erected at the inner end of the west pier, harbor of Grand Marais, Lake Superior, and 1,220 feet S. ¾ E. in rear of light on the outer end of the pier, with which it will form a range for entering the harbor. The light will be 54 feet above mean lake level. Vessels should not attempt to go alongside the piers, owing to the riprap stone having been placed there to within 5 feet of the surface.

The light-house board has issued an announcement of the establishment of the three new gas buoys which Inspector Hanford announced to the Review some weeks ago would be placed at points on Lake Erie. The

new buoy at Sandusky shows a fixed white light during periods of four seconds duration, separated by eclipses of ten seconds, and is on the northerly side of the entrance to the dredged channel across the bar. The buoy at Gull island shows a fixed white light and is on the northeasterly point of Gull island shoal. The Niagara reef buoy shows a fixed white light during periods of ten seconds duration, separated by eclipses of ten seconds, on the northerly side of a small reef and about 5¼ miles W. N. W. 5⁄8 W. from Green island light-house.

### Lloyd Water Tube Boiler.

The accompanying drawing illustrates a new type of water tube boiler, characterized by several features, which, it is claimed, will overcome many of the existing difficulties found in the operation of the steam generators now in use. There has been frequent demonstration of the claims of safety, efficiency, economy and convenience made for the water tube generator under the latter day conditions of high pressures and temperatures, but manifestly to justify these claims the greatest care must be taken in the construction of the boiler. Such an attention to detail in manufacture is claimed for the new boiler invented by Mr. W. A. Lloyd. According to the representations of Mr. Lloyd, among the points of value claimed for the boiler is its accessibility for repairs, being so designed that defective parts of the heating surface can be removed without disturbing any



of the jackets or cutting any tube other than the defective one, and an ability to maintain an even water level, the range, from operation at full force to a complete stop, not exceeding 2 or 3 inches, and being unaffected by a roll of the vessel.

The Lloyd boiler is constructed of marine steel with charcoal iron tubes, cast steel connections and steel frame for support. Straight tubes only are used and they are expanded in place. The tubes are so arranged that the water, entering at the bottom from the reservoir or mud drum, flows directly through and upward in each element until it reaches the separating pipe, which is at about the water level (a distance of three or four rows of tubes from the top), where it separates from the steam and returns through the downflow pipes at the sides to the reservoir, which must give a constant supply evenly to the tubes and create a positive, rapid and natural circulation. From the water level, or separating chamber, the steam passes through the upper tubes (which act as a superheater) to the steam dome, the steam being by this time perfectly dry, any moisture that may exist as the result of carrying the water too high in the boiler being relieved by the drain pipes in the bottom of the dome connecting with the downflow pipes, which afford communication back to the mud drum. The mud drum is of sufficient size to afford a plentiful supply of water for the tubes without any agitation of the water. It is claimed furthermore that if the tubes are kept plentifully supplied with water there will be no danger of their burning out.

In the general assembling of the parts, the greatest consideration has been given to the provision of allowance for expansion and contraction. At each end of each tube there is an opening in the header (in order to permit of the cleaning or removal of the tubes), covered by a small cap, which, in order to be replaced, requires neither grinding nor facing, being provided with a small and reliable metallic joint. The front and rear are fitted with large doors, which open the full space occupied by the ends of the tubes, thereby enabling the engineer to readily get at any tube in the boiler without entering the furnace. The sides are also fitted with doors, which, when open, permit of inspection of the whole interior of the boiler. It will also be observed that there are no tubes or pipes in direct contact with the fire, it being the idea of the inventor that such a plan is not only detrimental to the fires but contributes to the destruction of the tubes. The aggregate weight is reduced from the fact that there are no heavy brick walls around the fire, except in front to protect the fire door frames, etc. All joints are metallic, no screws, fiber, rubber or cement being used. The boiler is particularly adapted for marine use, although it can be used advantageously for stationary purposes. Mr. Lloyd, who, by the way, has been engaged in the actual work of designing and building boilers and engines all his life, is prepared to manufacture this new type of boiler to develop any required power. He has secured letters patent in this country covering all the characteristic features of the boiler, and application for patents has been made abroad. His address is Ashtabula, O.

Messrs. H. I. Crandall & Son, well known engineers and marine railway builders, East Boston, Mass., are about to begin the work of rebuilding the big marine railway at Halifax, N. S., that now constitutes part of the plant of the Halifax Graving Dock Co. This railway has a capacity of 2,700 tons weight and was first built by Mr. Crandall in 1863.



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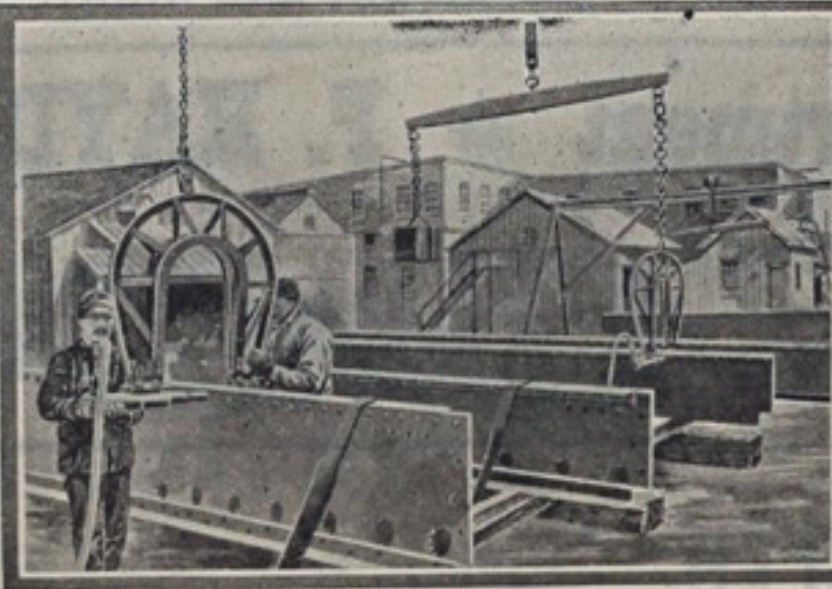
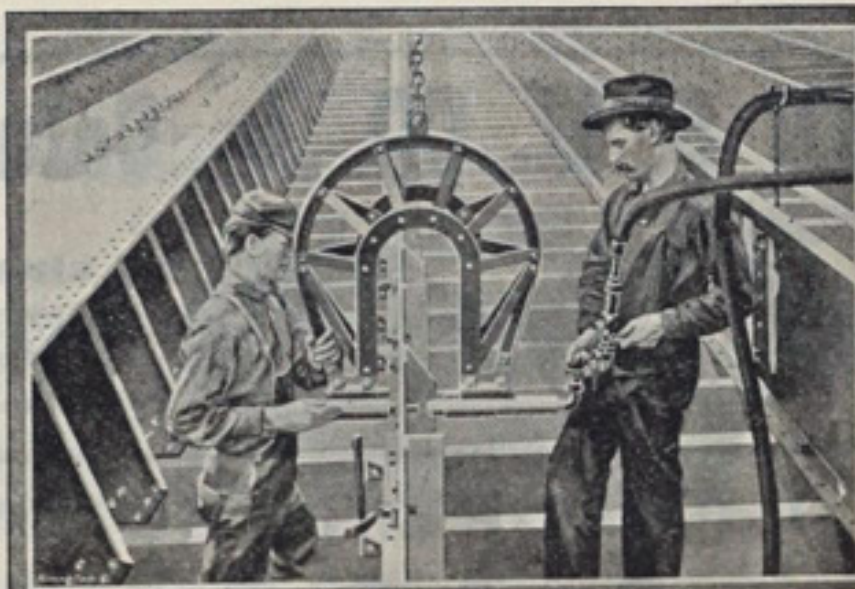
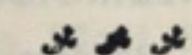
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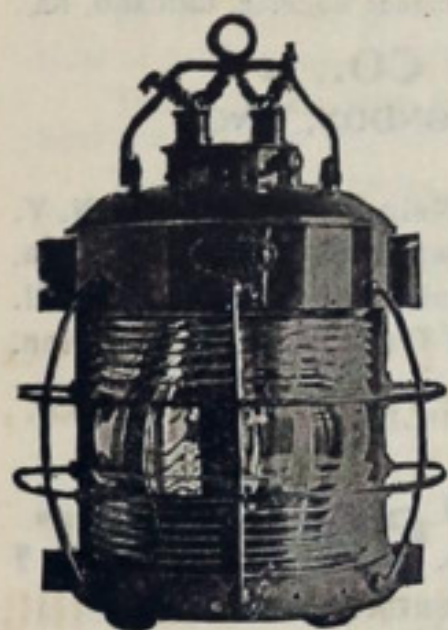
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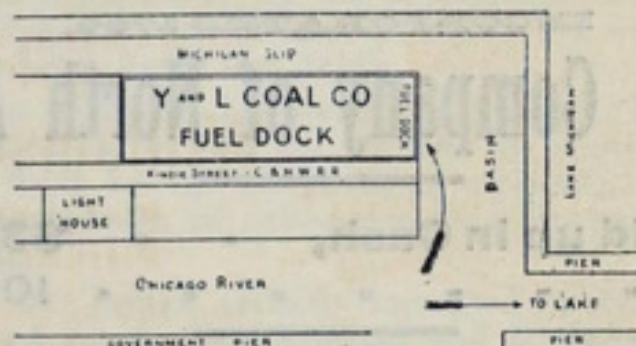
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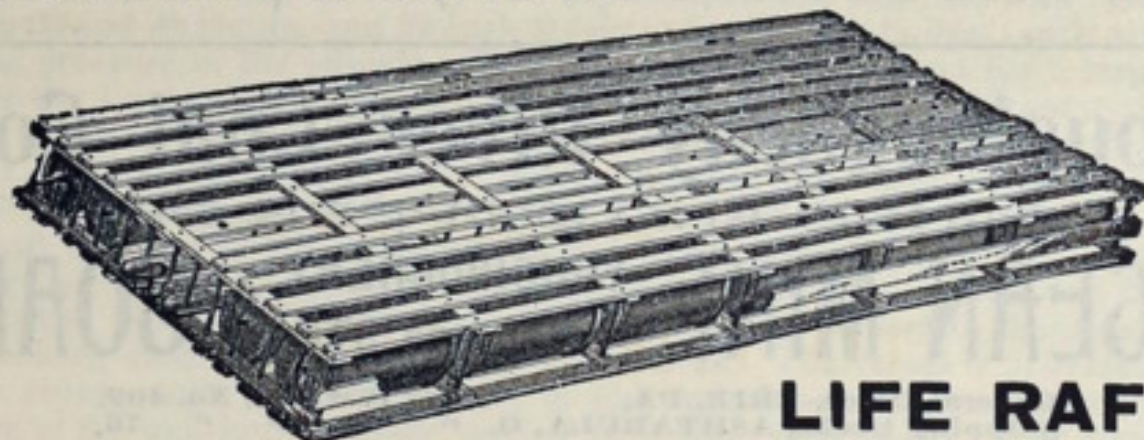
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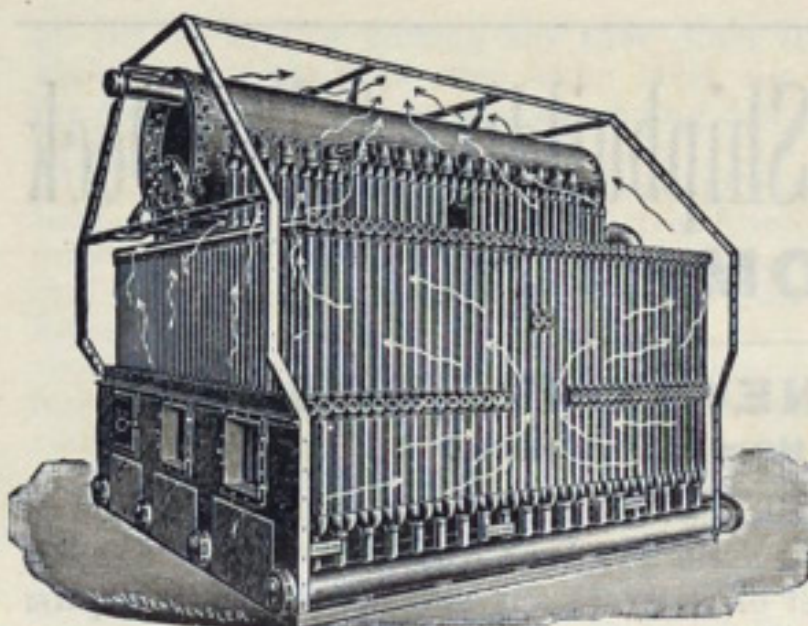
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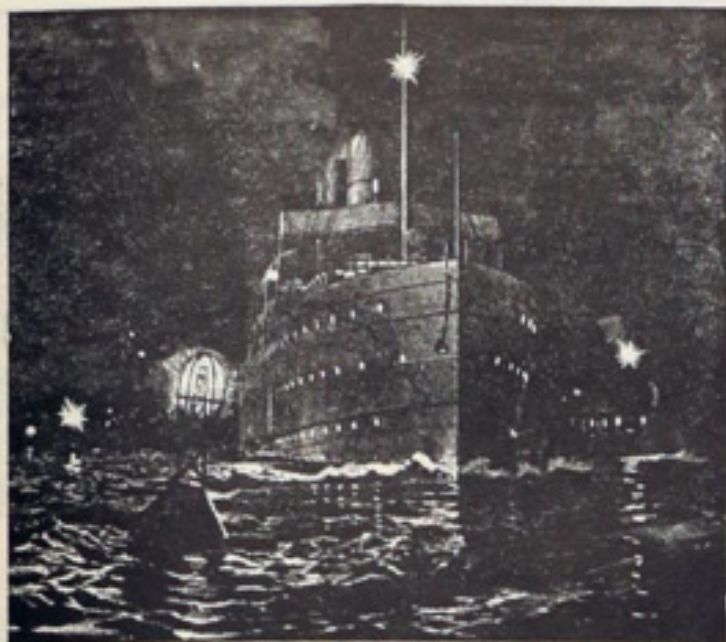
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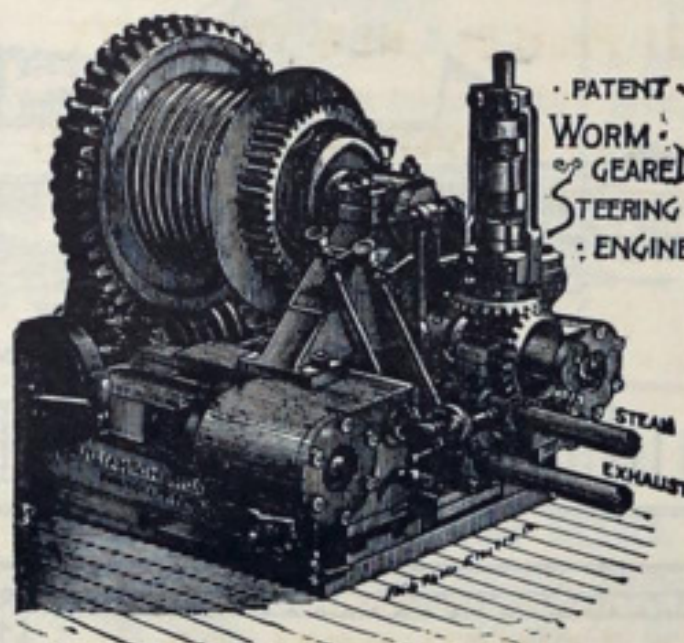
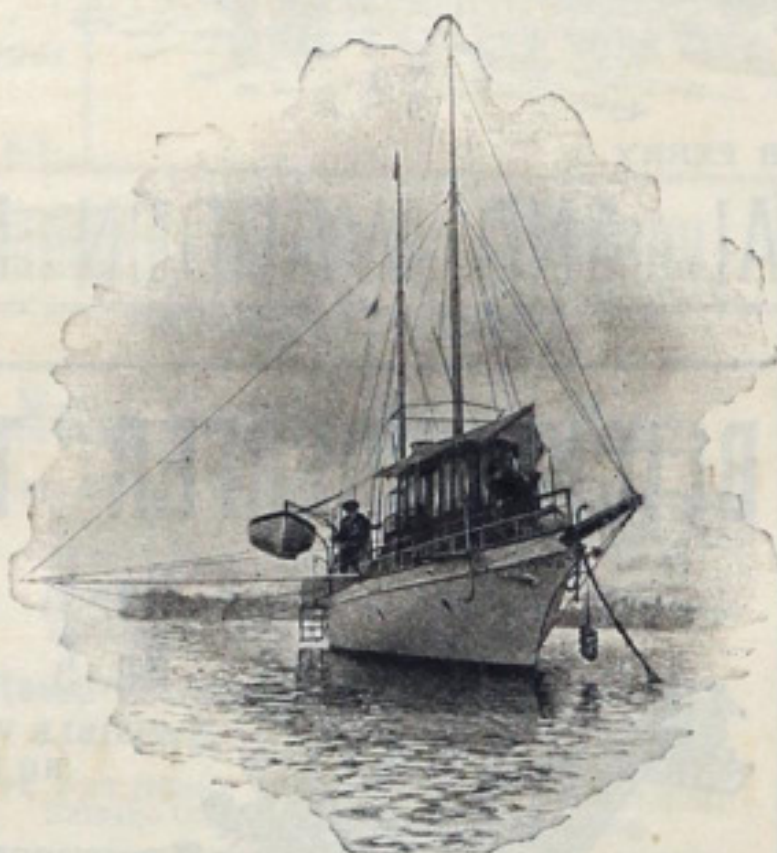
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22nd June 1898 189

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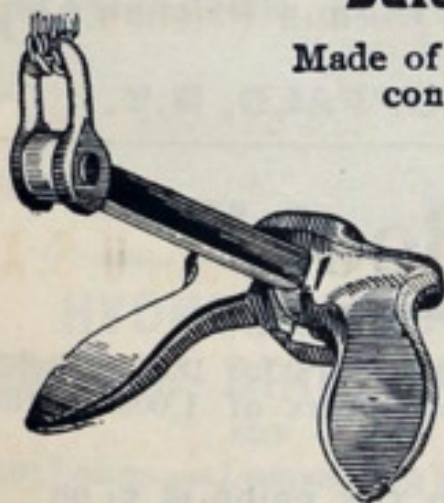
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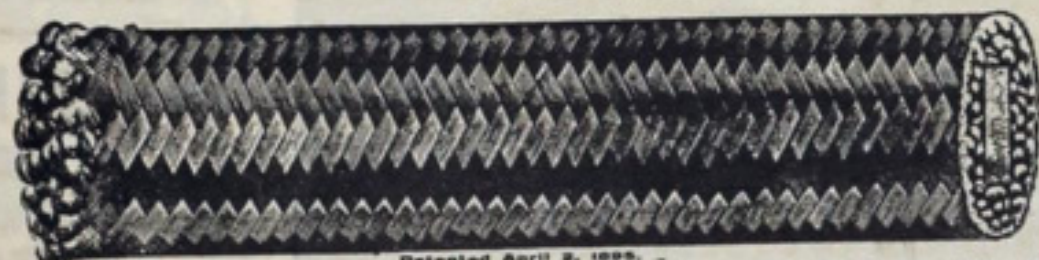
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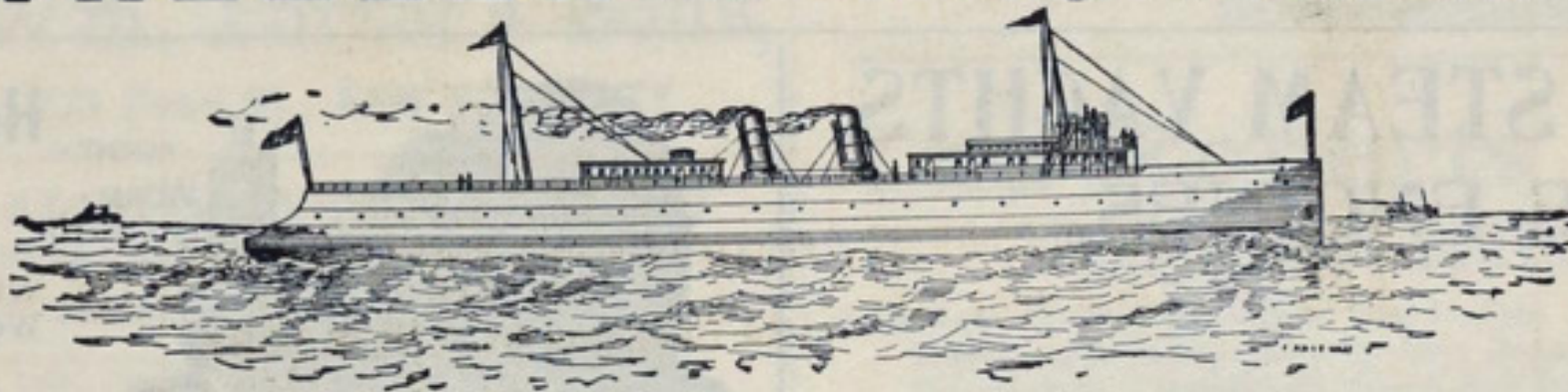
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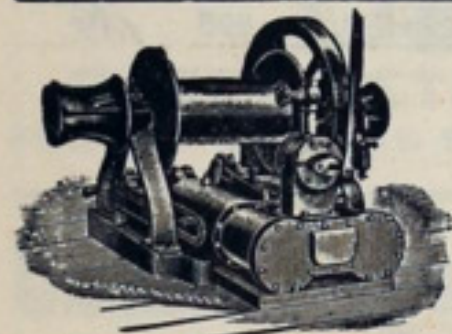
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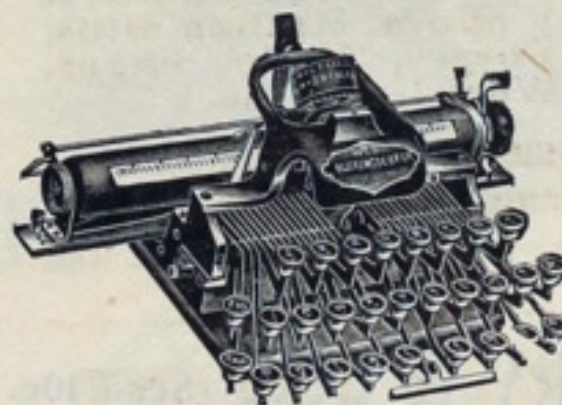
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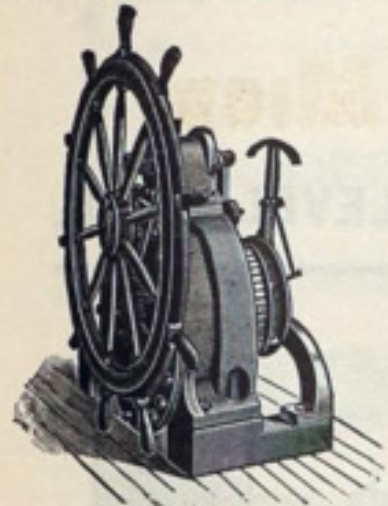
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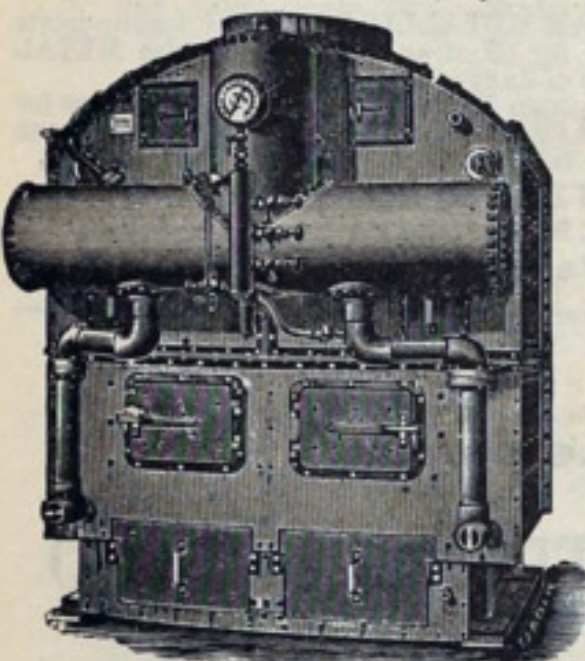
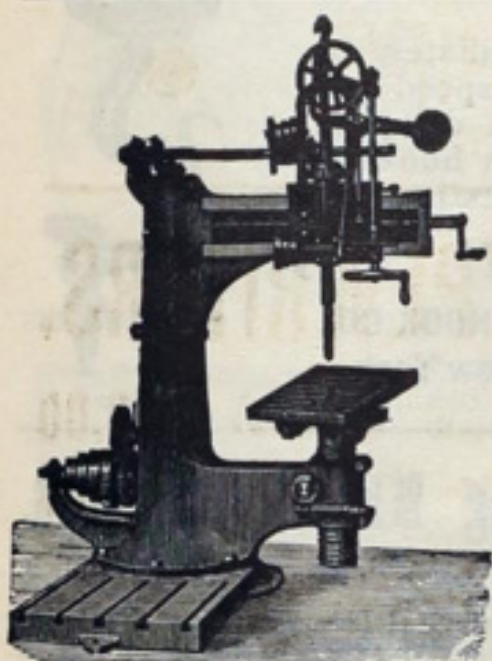
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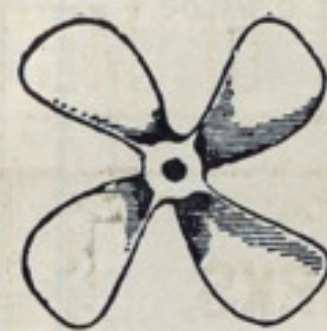
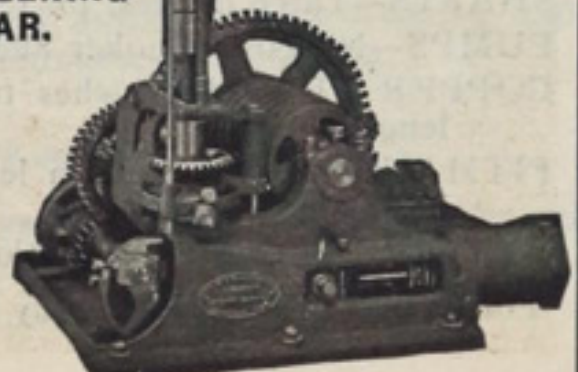


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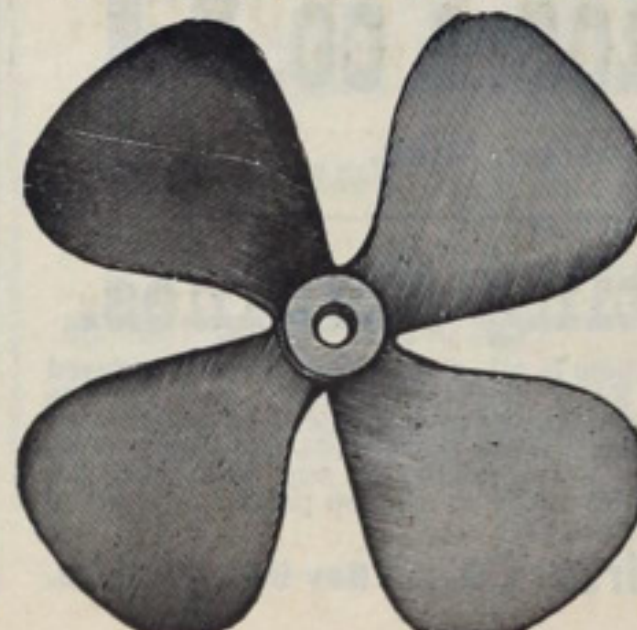
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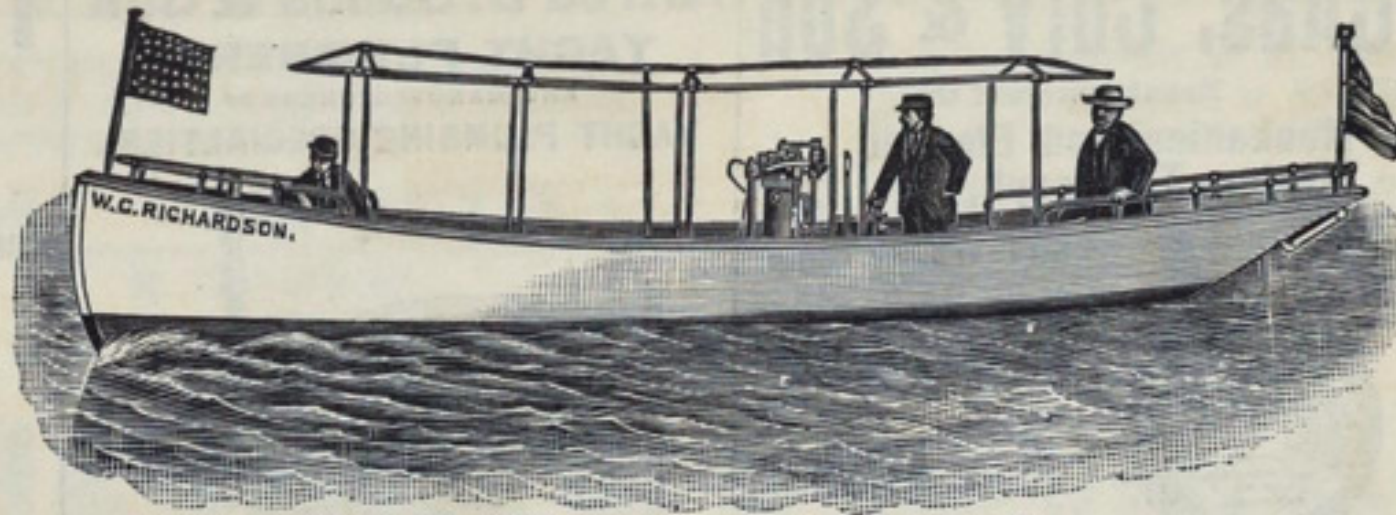


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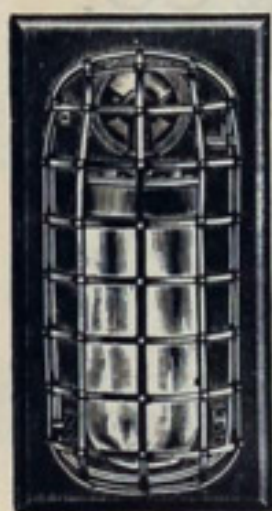
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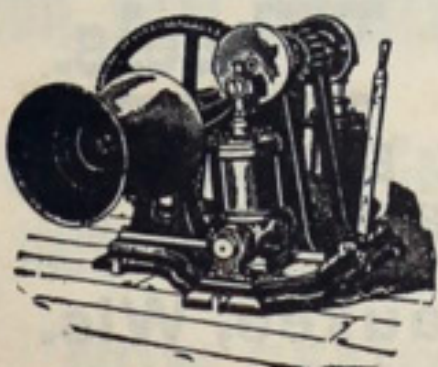
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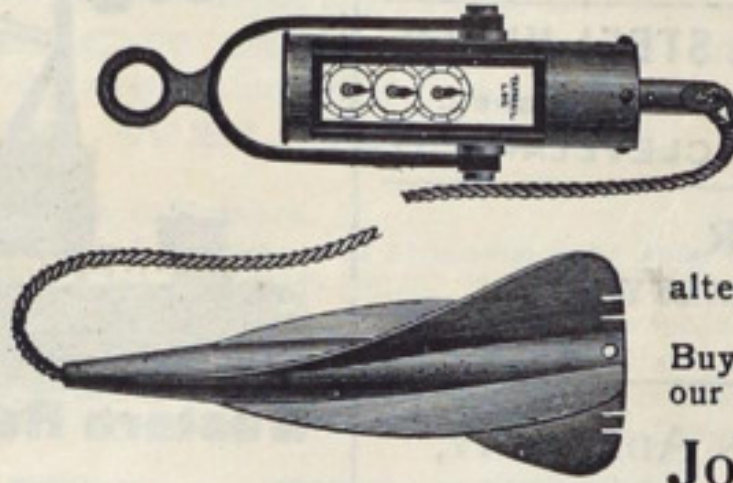
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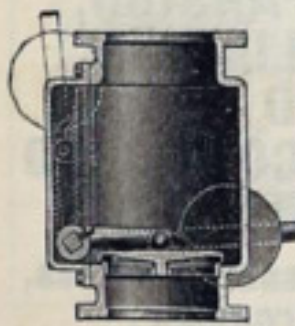
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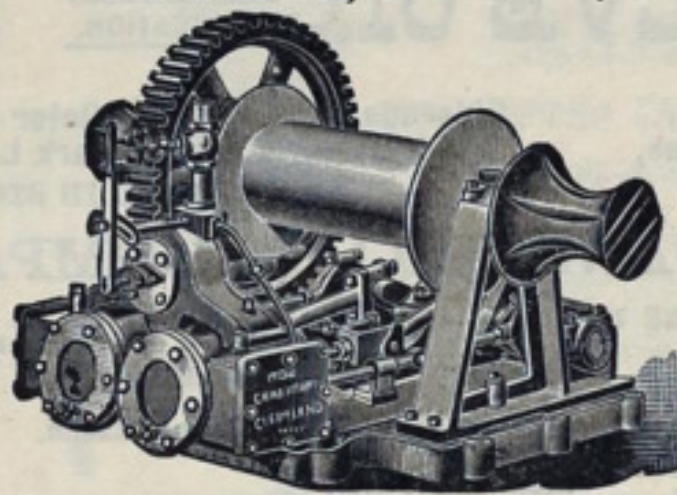
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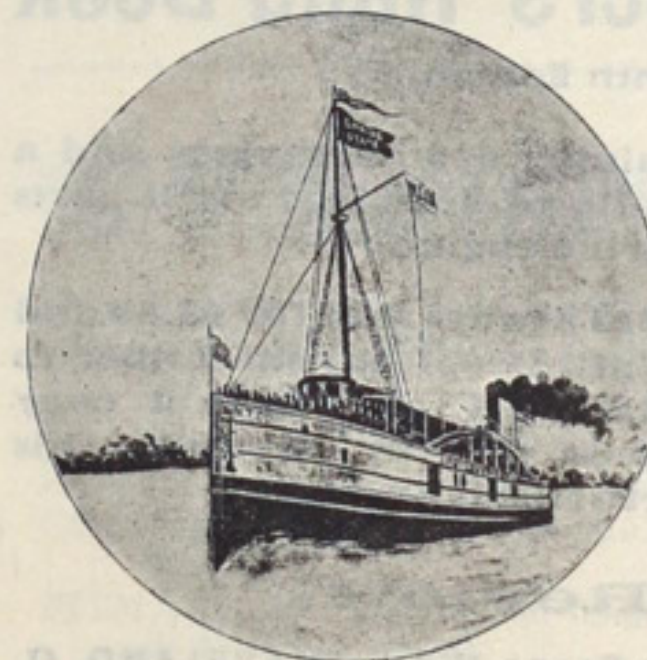
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**NO LAPS OR SEAMS OR WELDS.**

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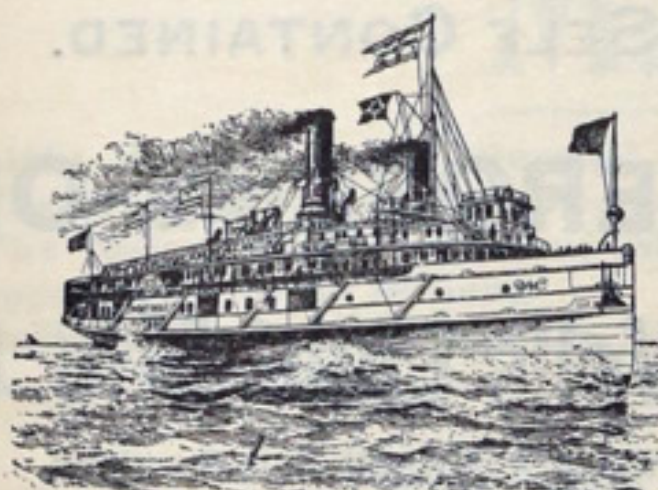
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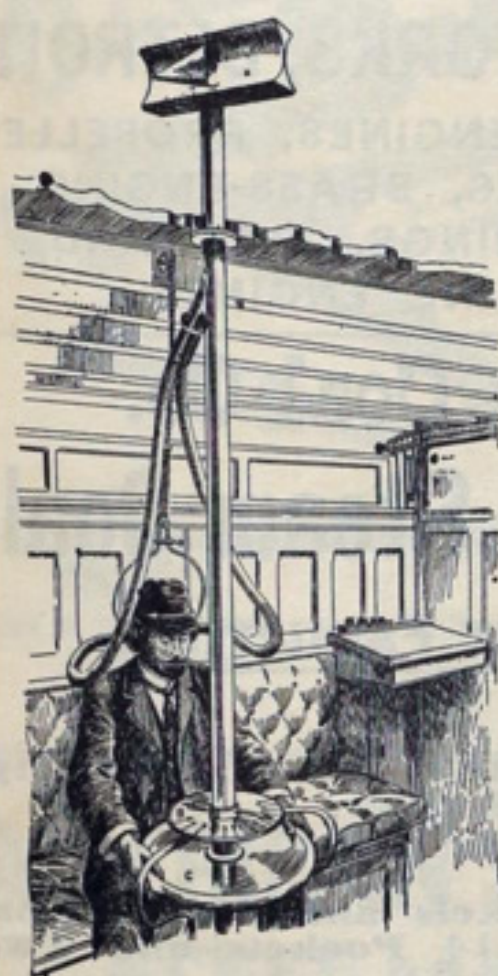
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It accurately locates the place from whence the sound comes, and shows its bearing on a dumb compass. It has been adopted by U. S. Revenue Cutter and Light House service, has favorable reports of board of officers of U. S. Navy and is in practical service on many coast steamers. \* \* \* \*

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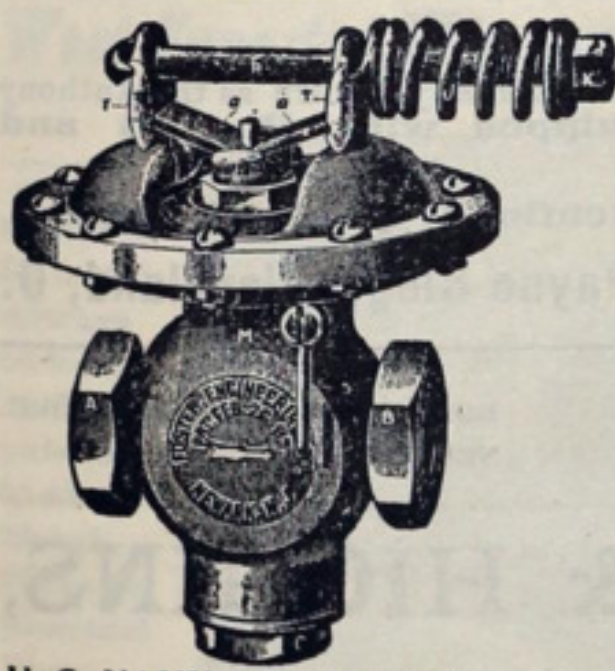
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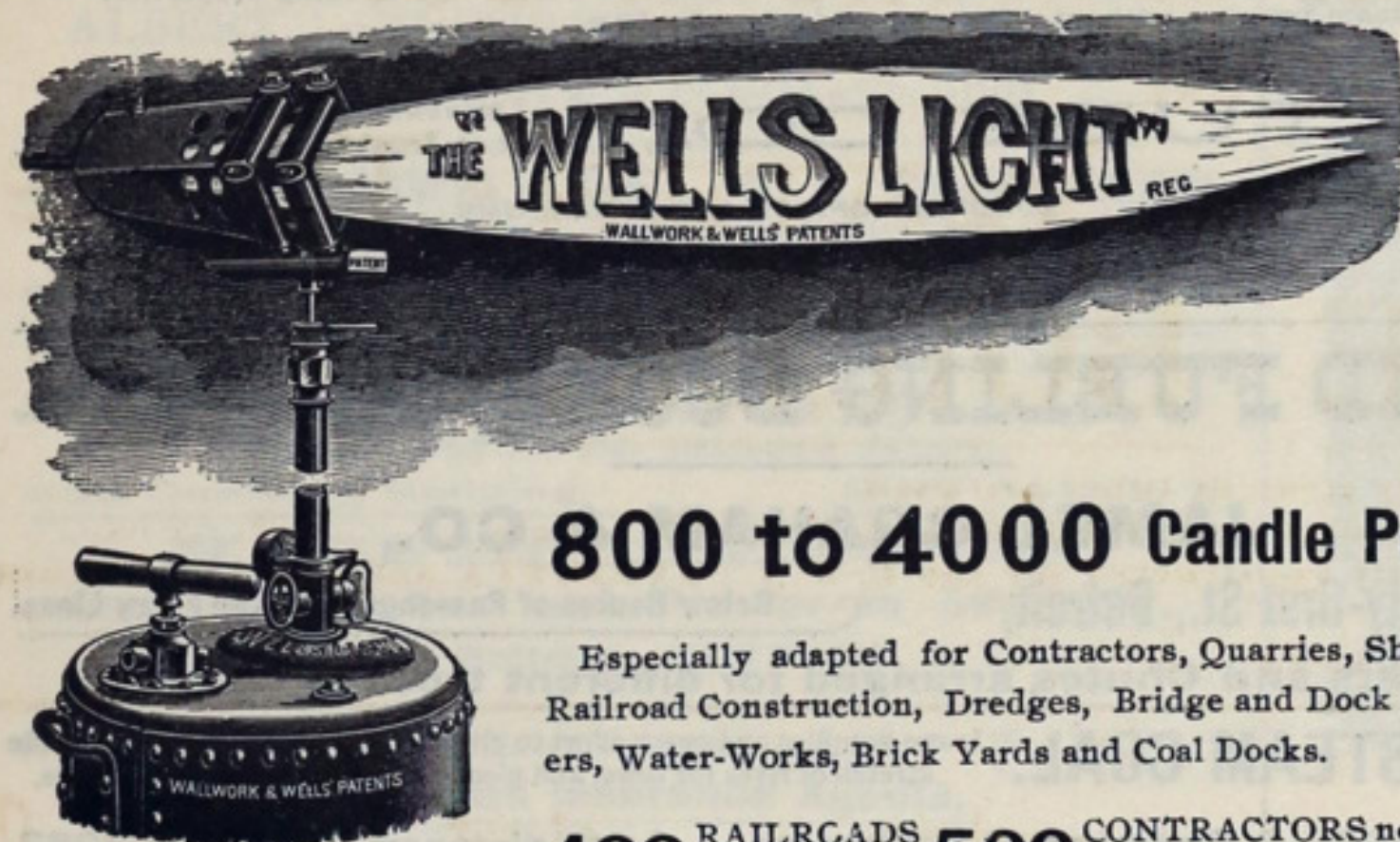
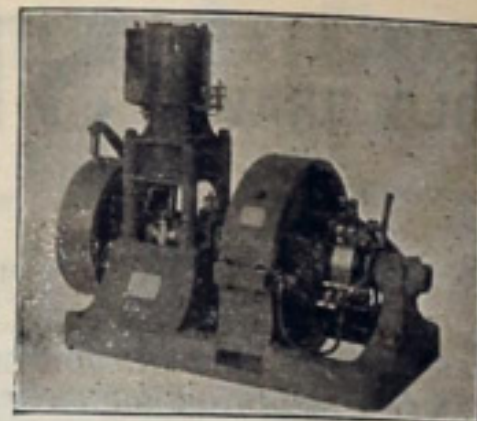
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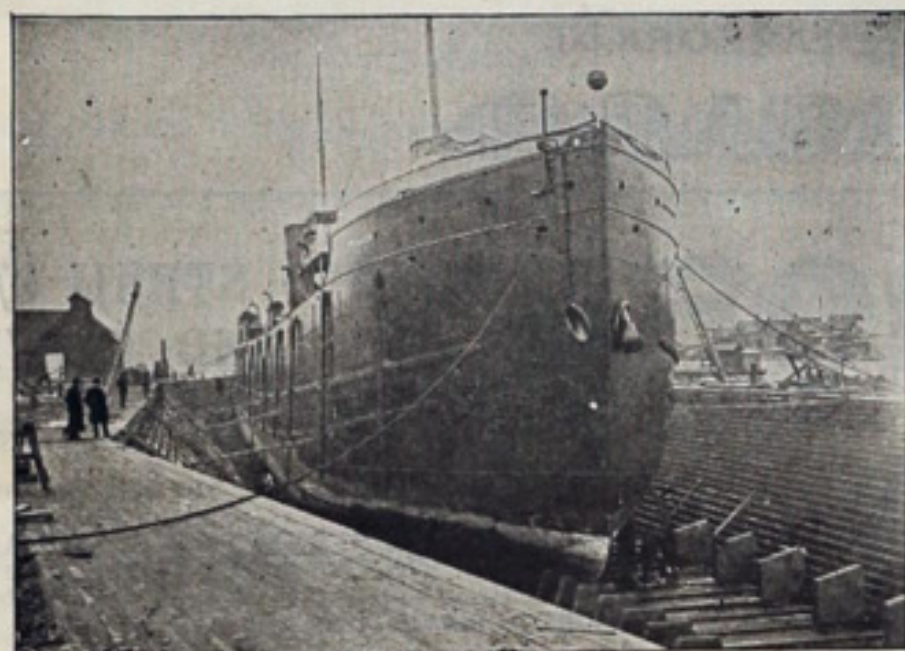


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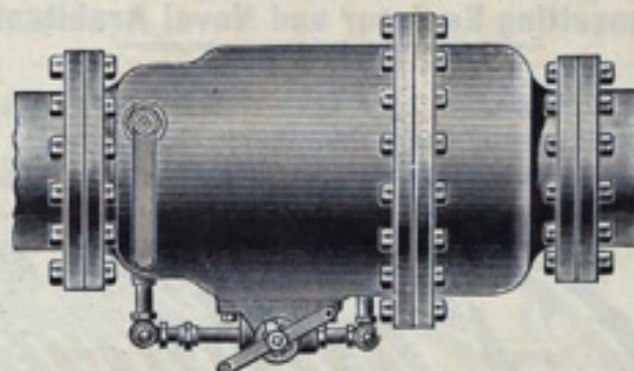
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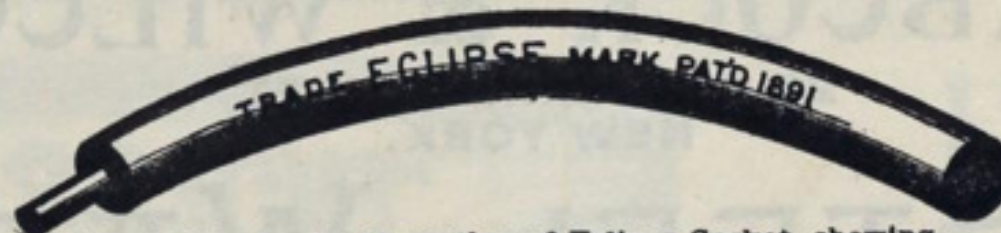


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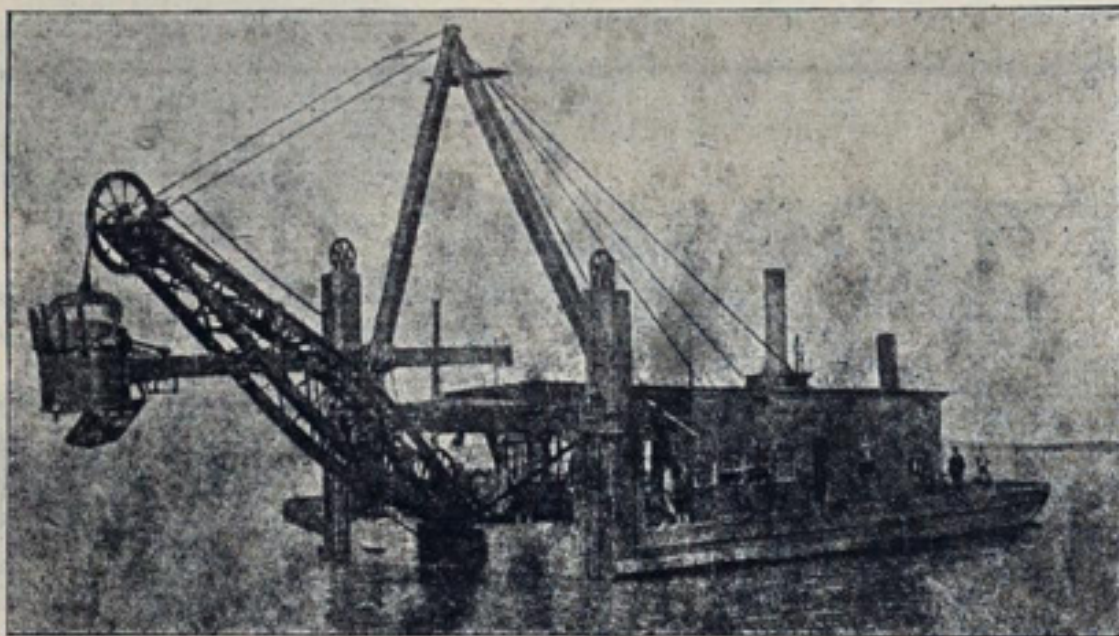
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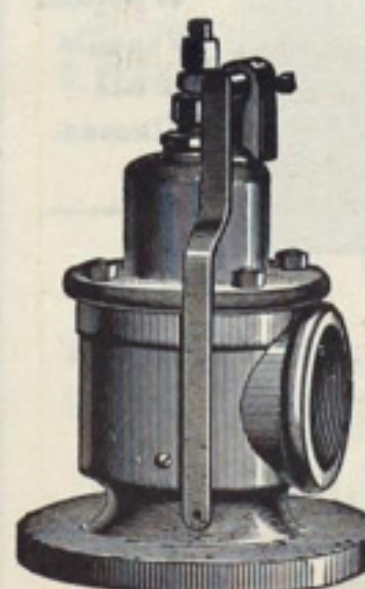
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